Chemical Week

March 21, 1953

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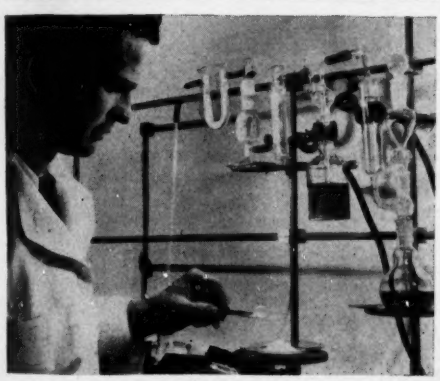

Par for 1952: sales up, operating costs up, plant outlay up; profits battered . . . . . p. 15

Spawned by sulfur shortage, nitrophosphate processes mature, vie for big stakes . . . . . p. 32

Patent law revamping spells out new procedures for foreign filing . . . . . p. 42

Market pulsebeat: inventories low, prices stable, prospect good to fair . . . . . p. 65

Battle of the bottles: novel sales problems beset reagent chemical makers . . . . . p. 69

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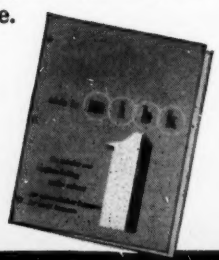

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Chemical Week

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MH 153

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OPINION . . .

McIntosh to Mobile

TO THE EDITOR: . . . All of us appreciate your great article "McIntosh to Mobile" (*Mar. 7*) . . .

The map you published is perfect.

However, you go on to say that McIntosh is on the Louisville & Nashville Railroad . . . It is on the Southern Railroad and the Tomigbee River. East of the Southern, the AT&N, now owned by the Frisco Railroad, runs south. Then the GM&O, still east. But the L&N joins in the Southern and these other railroads at Mobile . . .

I imagine that live-wire new president of the Southern, Harry DeButts, is really going to be surprised when he sees these five great plants are on the L&N . . .

. . . Several years ago, Ed Roberts, board chairman of the Waterman Steamship Co., and I went to see that human dynamo, Tommy Nichols, president of Mathieson Chemical Co. . . . Later he sent down a young man by the name of John Nason who looked things over . . . then he just kept sending men . . . Jack Leppart, executive vice-president . . . Joe Wood, vice-president of operations . . .

Had they not developed the salt dome at McIntosh, we would never have had the fine Geigy, Calabana, Stauffer and Courtauld plants . . . and we expect to get many more . . .

We can't keep from growing in that part of the country. We have been practically dead for 80 long years . . . are coming up so fast now we don't know what to do . . . We have so much coal, so much power, water, salt, oil, timber, and we are getting gas . . .

I believe the last survey showed 225 billion tons of salt . . . and it's close to the top of the ground. I believe we are going to get sulfur around the flanks of the dome . . . also oil . . . We now have 103 oil wells in Alabama . . . by this time next year I believe we will have 25 or 30 more . . . in the near future we will have a thousand . . .

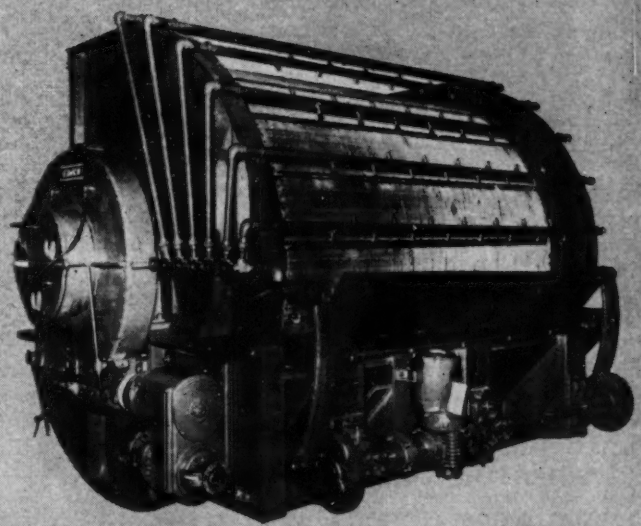
. . . Incidentally, they almost had the last battle between the states at McIntosh. They were building warships there then, and the Yankees burnt all the houses; but, bless their souls, they are building them back. Mathieson has built some of the most beautiful homes there . . .

You don't know how enthusiastic and thankful are these people who have lived there so long and struggled to keep going . . . We are very, very thankful that we have these plants . . . and thank you for writing the excellent article to tell people about this great development . . .

We want more people down there,

EIMCO Drum Type

CONTINUOUS VACUUM FILTERS



Eimco drum type continuous vacuum filters are heavy-duty machines for continuous 24 hour operation. Eimco filters are dependable, and fully automatic in operation.

Other Eimco filters are available in disc and top-feed design. All designs of Eimco filters are available in a wide range of sizes and with many different attachments.

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when the tinker's dam BROKE ~ we were flooded with good things!

We owe the Gypsy tinker much more than we can pay!

This old-time itinerant tinsmith contributed far more to posterity than the wares he made and peddled from door to door.

By his constant "tinkering" with tinplate, he discovered many new ways to use a metal that has proven through the years to be indispensable to our convenience and health.

When the tinker's dam broke . . . what burst upon the world has been a veritable flood of wonderful products and amazing alloys . . . products and materials that would not have been possible without . . . *tin.*

If *your* company is "tinkering" with the idea of improving your products with tin or tin chemicals, let Metal & Thermit lend a hand.

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Metal & Thermit Corporation has been headquarters for tin and tin chemicals for nearly half a century.

Many *new* tin chemicals have been developed by us *lately* that may have a bearing on your costs and problems.

If tin *in any form* has a place in your processing or manufacturing operations, we shall be glad to discuss the matter with you. Write today.

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100 East 42nd Street, New York 17, N. Y.

OPINION. . . . . .

we have so much room and we take good care of people . . . We give ten years state, county and city taxes free . . . we do want people . . . to help us develop these great resources that need development so badly . . .

FRANK W. BOYKIN
Congress of the United States
Washington, D.C.

TO THE EDITOR: We have read with interest your excellent news article "From McIntosh to Mobile" (*Mar. 7*).

Wherever did you get the notion that McIntosh is on the Louisville & Nashville Railroad.

F. CLIFTON TOAL
Asst. Vice President
Southern Railway System
Washington, D.C.

Our apologies, Reader Toal, and a sharp rebuke to one of CW's southern correspondents who fumbled—and to a damyankee CW researcher who didn't straighten it out.—ED.

Barnacle Facts

TO THE EDITOR: . . . That was an excellent news article (*Feb. 28*) in your "Specialties" department on control of barnacles . . .

We have noted the extreme accuracy concerning our compound—which you mention—as well as the factual information on fouling organisms . . .

We have always had a high regard for CW, and in view of the adherence to facts in this news article, we feel that we can always refer to your magazine as a reliable source of information . . .

R. D. SPIERS
Executive Vice-President
Dianol Inc.
St. Petersburg, Fla.

Safe Anti-Statics

TO THE EDITOR: We found your news article on anti-static compounds "Reducing the Charge" of considerable interest . . . we certainly like your policy of headlining new developments . . . encouraging research and investigation.

Since we supervised the development, testing and test marketing of Slip Ease . . . we can assure you that

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: W. A. Jordan, Chemical Week, 330 W. 42nd St., New York 36, N.Y.

Wyandotte Caustic Soda is now available in convenient open head drums!

Look at these advantages:

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No more guesswork. You can instantly see how much caustic remains in the drum.

Easily Accessible!

No more tilting, or turning the drum upside down to get at the remaining caustic.

Safety!

The rolled edges and open head protect the user from cuts and caustic burns.

The high quality of Wyandotte caustic in the new open head drums is unchanged. You'll still find among Wyandotte's many grades and forms the caustic soda best suited to your needs — for soaps, detergents and metal cleaners; food processing; paints, inks and dyes; for insecticides and textiles.

For Pilot-Plant Operations

Wyandotte Mercury Cell Caustic (50% liquid) can be obtained in nickel drums for pilot-plant operations, as well as in commercial quantities. This reagent-grade caustic is ideal for pilot-plant use, since the grade need not be changed when you convert to commercial production. This eliminates the "bugs" that often arise when a different grade is used in production than in the pilot-plant process.

You'll find Wyandotte a reliable and helpful source for all alkalies — caustic, soda ash, bicarbonate of soda, chlorine, calcium chloride. Write Wyandotte for our new caustic soda booklet . . . for help in specifying the right grade for your processes, consult Wyandotte.

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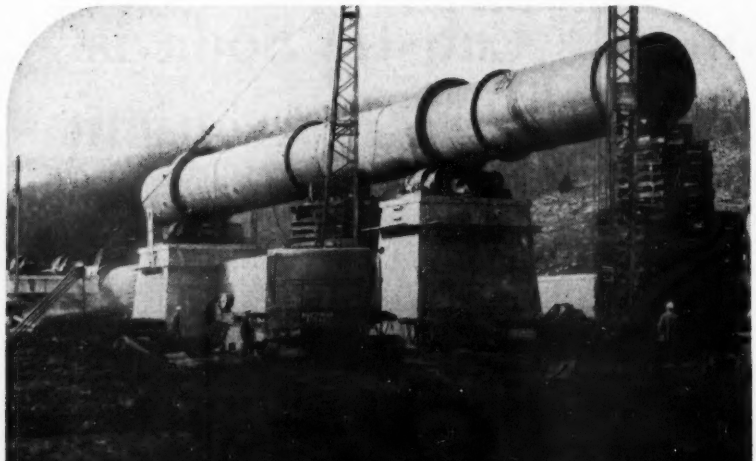


phase 4:

Foote's new lithium chemical plant

Workmen are dwarfed by part of the 340' x 10' diameter kiln now fully installed at Sunbright.

LOOKING AHEAD AT SUNBRIGHT

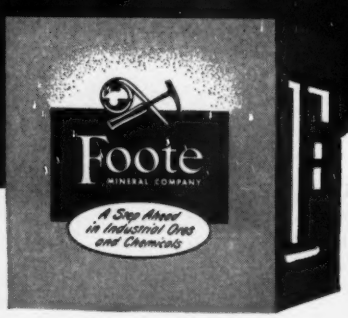
As construction of Foote's new lithium chemical plant progresses on schedule at Sunbright, Virginia, we approach the time when production capacity of the entire industry will be doubled. Foote's long range planning is nearing reality. Now is the time to investigate the economic advantages of lithium chemicals. Project your plans with Foote lithium.

phase 3—Pilot plant operations of an exclusive lithium process developed by Foote.

phase 2—Kings Mountain, N.C.—Mining largest known deposits of spodumene.

phase 1—Continuing Foote research . . . finding new and improved uses for lithium chemicals.

FOOTE . . .
LEADERSHIP IN LITHIUM



FOOTE MINERAL COMPANY
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RESEARCH LABORATORIES: Berwyn, Pa.
PLANTS: Exton, Pa.; Kings Mountain, N.C., Sunbright, Va.

OPINION . . . . . .

there is a market for such a product. However, it is a pioneer market . . . and competitors in any market, especially a new one, can make or break that market by the adequacy or safety of the products they sell . . .

A word of caution should be said to anyone enthused about anti-statics . . . We agree with your statement that the ideal solution to the anti-static problem would be a product which rendered the fabric permanently free from static electricity. Thus far we have found no products which could perform this function . . . still be safe for general use.

Cationic surfactants have definite advantages . . . but toxicity studies show they produce irritations . . . especially where they directly contact the skin or mucous membranes. Since any garment to be rendered static-free must retain a quantity of the agent . . . use of a cationic may lead to dermatitis . . .

"Chemical Itch" (*CW, Oct. 18, '52*) and "Potent Polonium" (*ibid.*) describe cases which are pertinent to what we have stated above . . . We will not say that the agents involved in those cases were cationics . . . but cationics do cause such effects as these news notes described.

Studies on the effect of surfactants on the rabbit cornea (*Drug and Cosmetic Industry,* Aug. '52) indicate that only nonionics, and not all of those, are safe as contact agents. Safe is a relative word but be certain your product is relatively safe . . .

Some cationics are considered non-irritant in solutions of less than 0.1% concentration . . . While it may be considered that the concentration in textile fabric . . . would not be greater than 0.1%, we sincerely caution against the use of any surfactant without extensive and thorough study . . .

If we seem to have emphasized cationics, it is because they so often seem to be the offenders and they do have excellent anti-static properties . . .

GEORGE P. BUTTERFIELD
Butterfield Laboratories, Inc.
Chicago, Ill.

Oklahoma Benefits

TO THE EDITOR: Your news article "Succor for Survivors" (*Feb. 28*) . . . states, regarding workmen's compensation laws, that "Oklahoma is the only state that pays no death benefits whatsoever."

Oklahoma state law does require death coverage and has since May, 1951. In fact, it provides a maximum benefit of $13,500—one of the highest,

It takes an expert to tell the difference

The difference between a product that will make a profit—and a dud—is seldom apparent in the development stage. Less than 10% of all new products prove successful within the first four years.* Cut down your percentage of wrong guesses by consulting Aries & Associates on new products for the chemical process industries.

Aries & Associates have had a combined total of over 250 years of experience in solving technical and economic problems in the chemical field. They have successfully completed 700 consulting assignments in the past six years. They are experts in evaluating the processes, competition, and market aspects for new chemical products, foreseeing technical and economic difficulties.

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REPRINT AVAILABLE ON REQUEST: Estimates of Production of Synthetic Organic Chemicals for 1955 and 1975. Send for Bulletin CW15301

*U. S. Dept. of Commerce Estimate

ARIES

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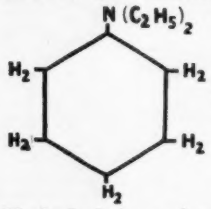
CHEMICALS AND INTERMEDIATES TO MEET YOUR REQUIREMENTS

N,N-Diethylcyclohexylamine Technical

M.W. 155.3



DESCRIPTIVE INFORMATION

N,N-Diethylcyclohexylamine Technical is a clear, colorless liquid which is soluble in ether and benzene and slightly soluble in water. Traces of cyclohexanone and N-ethylcyclohexylamine may be present as impurities. N,N-Diethylcyclohexylamine Technical is available in commercial quantities.

SPECIFICATIONS

N,N-Diethylcyclohexylamine Technical is produced to these specifications:

Purity . . . 98.5% minimum
Moisture Content . . . 0.1% maximum
Distillation Range . . . It shall distill 5 to 95 cc within 2.0°C., including the temperature 194.5°C., corrected to 760 mm.

SUGGESTED USES

This product is worth investigating as an intermediate for emulsifying agents and as an acid acceptor in organic reactions where pyridine is now being used. N,N-Diethylcyclohexylamine should also be of interest as a starting material for quaternary derivatives.

DO YOU NEED A SPECIFIC INTERMEDIATE?

A WIDE VARIETY of chemical intermediates is now available from the Du Pont Organic Chemicals Department. It will pay you to evaluate these products for your manufacturing processes.

A NEW INTERMEDIATE? We have the facilities to produce specific intermediates . . . perhaps one that will meet your exact requirements. Our technical men will be glad to study your problems and work with you in product development.

A REQUEST on your company letterhead will bring complete information. Just write to E. I. du Pont de Nemours & Co. (Inc.), Organic Chemicals Dept., Chemicals Div., Wilmington 98, Del.

DU PONT
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BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

ORGANIC CHEMICALS DEPARTMENT

OPINION . . . . . .

if not the highest, of any state. . . .

H. GLENN HENDERSON
Tulsa Testing Laboratory
Tulsa, Okla.

Synthetic Betaine

TO THE EDITOR: In your otherwise excellent news article on amino acids (*Mar. 7*) you state that, "apart from methionine, amino acids are mainly research chemicals."

. . . Betaine, an amino acid widely occurring in nature and produced by us synthetically, has important uses as a medicinal . . . is used as an intermediate in the production of surface-active agents, disinfectants and other chemicals. . . .

P. C. HERELD
Executive Vice President
Chemo Puro Manufacturing Corp.
Long Island City, N.Y.

Thank you, Reader Hereld. We did indeed omit betaine—and a number of other aminos—but consciously. Our reporting was concerned only with an appraisal of amino acids as poultry and animal feed supplements.—ED.

"Chock Full"

TO THE EDITOR: . . . I have been a continuous subscriber for the past 15 years. I have always enjoyed your periodical, particularly since it has become the brief, concise and factual CW.

I always take time out to read it from cover to cover because it is "chock full" of helpful information.

H. A. PINKALLA
President
American Bio-Synthetics Corp.
Milwaukee, Wis.

Practical Focus

TO THE EDITOR: Your new CW feature "Target" deserves a letter of thanks for an intelligent addition to the list of services you are supplying the chemical industry.

We have found the first two brought positive responses from our staff: they stimulated suggestions based on previous work potentially useful in reaching the objectives defined in these articles. With the constantly expanding domains of interesting exploratory research it is invaluable to have attention focused in a practical way on an economically desirable field.

Again our congratulations on the increasing value of CW.

HOWARD E. SMITH
Director
Centro Research Laboratories, Inc.
Ossining, N.Y.

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BUT GREASE LIFE NEED NOT LIMIT MOTOR LIFE. Tri-Clad motors give long life without relubrication, plus provision for adding new grease when necessary.

ADDED GREASE IS USEFUL GREASE. Relubrication puts fresh grease in storage in bearing housing . . . as motor operates, grease oils migrate to bearing as needed.

TRI-CLAD MOTOR BEARING IS EASIEST TO REGREASE. Do it on the job, with motor running . . . no dismantling . . . no trip to a service shop.

TRI-CLAD MOTOR BEARING IS BETTER PROTECTED. Completely enclosed housing has *longer seals* to keep dirt out, *larger grease supply*, and *scientific design* for continual grease migration.

THIS PRACTICAL BEARING DESIGN is one more reason why G-E Tri-Clad motors give better service . . . added life. Order through your nearby G-E Apparatus Sales Office or authorized G-E agent or distributor. General Electric Company, Schenectady 5, N. Y.

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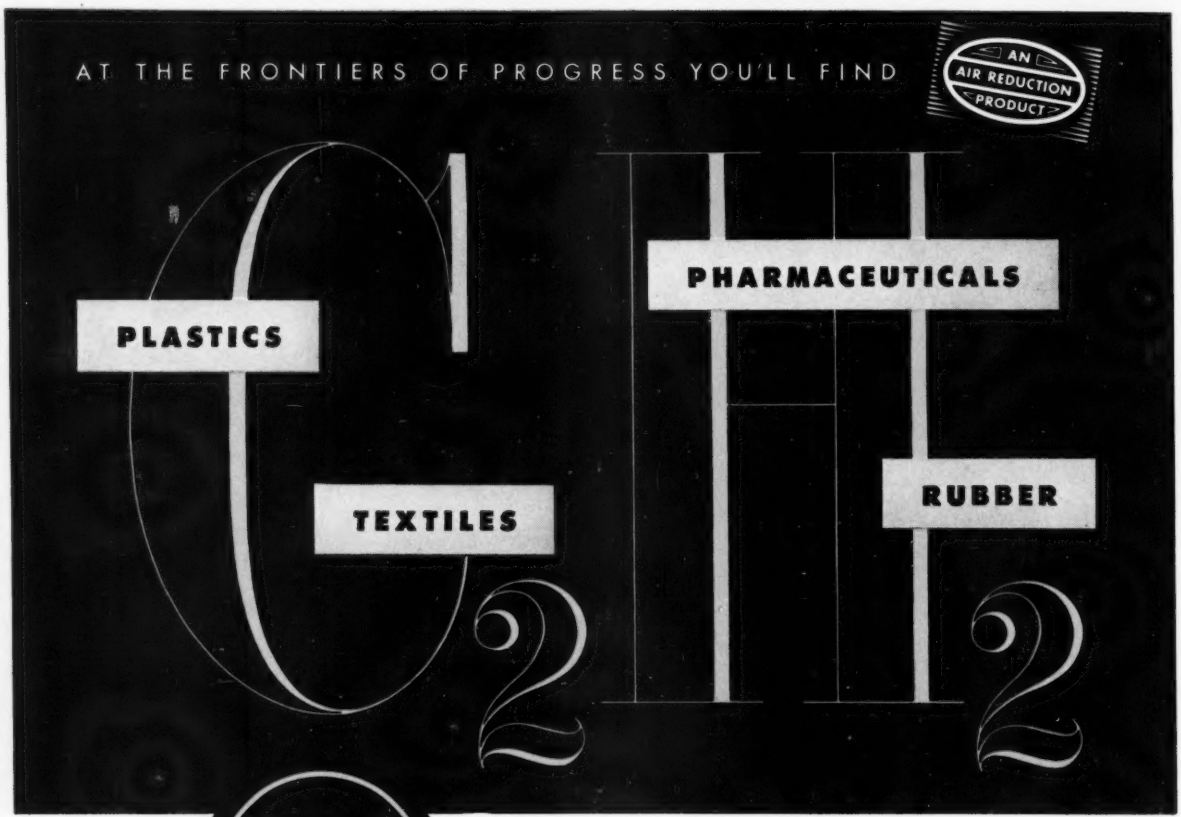

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Acetylene generated from calcium carbide is a basic material for synthesis of many substances. Today, chemical producers use acetylene in the production of vinyl chloride, vinyl ethers, vinyl acetate . . . vinylidene chloride, vinylidene acetate . . . pyridine derivatives . . . halogenated hydrocarbons . . . acetic acid, acetic anhydride . . . acetone . . . acrylonitrile . . . acetylenic alcohols and acetylenic glycols.

Still other uses of this remarkable gas lie somewhere between the research laboratory and the limitless horizons of chemistry.

National Carbide is one of the world's largest producers of calcium carbide and acetylene. Its newest plant at Calvert City, Kentucky, will be capable of turning out approximately 300,000 tons of calcium carbide yearly—the acetylene equivalent of which is around 2,700,000,000 cubic feet. Potential users can be supplied acetylene by pipeline at available adjacent properties. National Carbide also furnishes calcium carbide to chemical producers for generation into acetylene at their individual plants.

We shall be glad to discuss your calcium carbide or acetylene requirements with you.

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NEWSLETTER

New circumstances call for new laws. Rapidly growing use of anhydrous ammonia as a fertilizer has prompted introduction of a bill now being debated by the North Carolina state legislature. It's important, for its broad outlines may well set the pattern for other states:

- The bill would require all liquid fertilizers to be stored in containers meeting ASME standards for working pressure of 250 lbs./sq. in. It would be illegal to sell the products in low pressure containers.
- Wholesale and retail distributors would be required to carry at least $10,000 insurance for each liability or furnish $20,000 bond.
- The state department of agriculture would have to approve the layout of any retailer's or wholesaler's proposed plant.

There may be some relatively indirect but, nevertheless, far-reaching implications for the chemical process industries in President Eisenhower's first reorganization plan, now in the hands of Congress. It would give the Federal Security Agency departmental status (Department of Health, Education and Welfare), raise Administrator Oveta Culp Hobby to cabinet rank. That may sound like a simple change-in-name-only, but it would permit replacement of top-level chiefs with men of the Administration's own choosing—and that could make a real difference in policy and operating methods of the Food and Drug Administration and the Public Health Service.

Policy makers in Washington privately admit that they can't effectuate their ideas through civil servants who are not in sympathy with the new Administration; and FSA has one of the highest proportions among government agencies of "protected" jobs.

Another reorganization involves the Army's Chemical Corps' procurement setup, and it will make quite a difference if you sell chemicals or equipment to the Corps.

The keynote is consolidation. Procurement activities in Boston will be transferred to New York, as will industrial-type buying now done at the Corps' Maryland center. Research and development contracts, formerly under jurisdiction of the Materiel Command, will be transferred to the Research and Engineering Command.

Changes at the Chicago and Dallas district offices reflect the Corps' experience with the Industrial Fund setups at Rocky Mountain and Pine Bluff arsenals. Responsibility has been split between chiefs of the arsenals and chiefs of the procurement districts in which they are located, necessitating much headquarters coordination. Now Chicago and Dallas will buy only for the arsenals in their respective districts.

It's all supposed to add up to a $300,000/year saving.

British chlorophyll makers have risen in wrath, filled three columns of the British Medical Journal with angry letters disputing the recent paper by Glasgow University's John Brocklehurst wherein he said that chlorophyll has no deodorant properties (*CW* Newsletter, Mar. 14).

They question some of his experimental techniques. But Brocklehurst replies in counter-rebuttal: "The onus for producing some proof of a deodorant action still lies with the protagonists of chlorophyll."

Another product the efficacy of which is questioned is krebiozen, the alleged cancer cure that stirred up a tempest at the University of Illinois. Introduced by two Yugoslavian refugees, the product was studied

by the University's Pr. Andrew Ivy. Later, the president of the University, Georg Stoddard, ordered the school's researches to be halted.

The Illinois legislature is taking a role in the controversy. It has set up a 14-member committee, which held its first hearing this week in Springfield—a preliminary one "to determine what the controversy is and how it arose."

Dow Chemical Co.'s Canadian arm, Dow Chemical Ltd., won a round in the fight to protect its glycol output at Sarnia, Ont., from duty-free U. S. exports. The Canadian tariff board ruled last week antifreeze compounds are mixtures (including di- and triethylene and propylene glycols) and are not simply ethylene glycol, which is free of duty.

The ruling paves the way for a 20% tariff on such mixtures.

General Aniline & Film officials are in Washington this week testifying before a Senate committee probing conduct of the Office of Alien Property. The committee has already been at work questioning OAP employees, trying to learn whether the agency has been dragging its feet on disposal of enemy assets seized during World War II.

Sen. Everett Dirksen (R., Ill.), committee head, hopes to shape legislation by May 1 that would enable the government to sell General Aniline. The legal issues are thorny and complex. Chief stumbling block is the claim of I. G. Chemie, the Swiss concern that holds 97% of the stock, that it is bona fide—not a front for Germany's I. G. Farben Trust. Selling the firm before the ownership issue is settled would require amendment of the Trading with the Enemy Act, and some experts question the constitutionality of such an action.

One possibility: selling the firm, holding the proceeds in escrow pending settlement of I. G. Chemie's claims.

Now in operation is the Atomic Energy Commission's reactor testing station at Idaho Falls, run for AEC by American Cyanamid Co.

Results from this station will determine to a large degree the economic feasibility of atomic power, for the work at the station will be to reprocess used atomic "fuel," removing the waste fission products and purifying the residual uranium-235 for re-use.

This is the time of year when printing presses are grinding out annual reports by the millions. *CW's* cross-section survey is on p. 15, but here are some additional ones:

• Koppers Co. tells a familiar story: higher sales ($323 million vs. $289 million—up 12%) and lower net ($8.6 million vs. $10.8 million—down 20%). Reasons ascribed: higher material costs, fast amortization, higher wages, price ceilings and taxes.

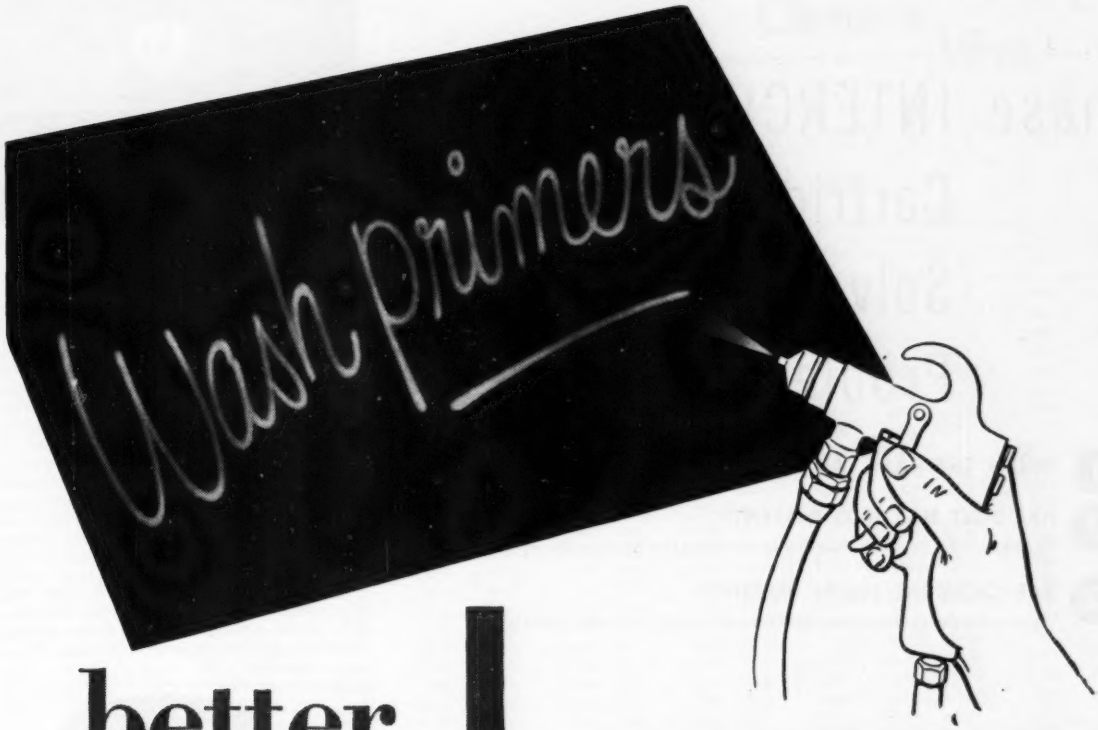
• Sharp and Dohme likewise had higher sales ($50.4 million vs. $45.7 million—up 10%) and lower net ($3.9 million vs. $4.6 million—down 14 %). Blamed: antibiotic price drops, low profit on sales to government.

• Abbott Laboratories, too, had a sales rise ($85.5 million vs. $84.4 million—up 1.3%) and a profit drop ($8.3 million vs. $10.4 million—off 15%), again ascribed to antibiotics' weakness.

• Heyden Chemical's sales dropped a full 25% ($22.3 million vs. $29.8 million) and net plummeted almost 50% ($1.21 million vs. $2.36 million). Again, antibiotics.

• Riding the Chlorophyll boom was Strong, Cobb. Sales were up over 30% ($11.6 million vs. $8.8 million), net was up over 30% also ($407,000 vs. $305,000).

. . . The Editors



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Mutual does not make wash primers or chromate pigments, but contributes to their production by supplying the industry with basic chromium chemicals of uniformly high purity.

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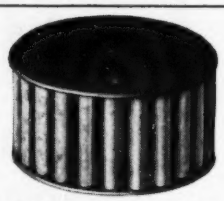
R25 chemically treated felt filter for poisonous and disease-producing dusts and a combination of all dusts—toxic, nuisance and pneumoconiosis-producing. B.M. 2154



R15 cartridge for nuisance and pneumoconiosis-producing dusts in mining, quarrying and tunneling of quartz, sand, asbestos, coal and marble. B.M. 2121

R16 cartridge for toxic dusts caused by grinding and crushing lead, cadmium, arsenic, chromium, manganese, selenium, vanadium, etc. B.M. 2138

R17 cartridge for combination of all dusts—toxic, pneumoconiosis-producing and nuisance. B.M. 2138

R32 for acid gases, fumes, mists from plating, pickling tanks, etc. such as sulphuric acid, hydrogen chloride, nitric acid.

R34 for protection against nuisance concentrations of ammonia.

R33 for combined acid and organic gases such as halogenated hydrocarbons, carbon tetrachloride, and acetic acid in degreasing operations, etc.

R31 for light organic fumes, vapors, and gases generated in paint spraying, degreasing, dry cleaning, cementing, etc.

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BUSINESS & INDUSTRY . . . . .

CHEMICAL COMPANY EARNINGS—Calendar 1952

(000 omitted)

	Total Sales		Pre-Tax Earnings		Taxes				Net Earnings			4th Quarter Net	
	1952	1951	1952	1951	1952	%	1951*	%	1952	1951	%	1952	1951
Air Reduction	$ 124,625	$ 118,131	$ 17,047	$ 19,825	$ 9,000	52.8	$ 12,514	63.0	$ 7,290	$ 7,482	— 2.6	$ 1,728	$ 2,417
Allied Chem. & Dye	490,193	502,027	80,417	106,706	4,030	38.9	4,200	51.8	6,223	3,910	61.7	627	659
American Cyanamid	369,000	388,717	49,512	83,288	22,900	46.3	48,500	58.2	26,612	34,788	—23.5	9,680	4,557
Atlas Powder	52,970	51,673	4,241	5,368	2,219	52.3	3,335	62.1	2,022	2,033	— 0.5	591	485
Commercial Solvents	50,279	61,172	2,315	11,308	1,320	52.6	5,465	48.3	1,368	5,842	—76.3	920	1,388
Davison Chem.	51,506	44,910	5,175	5,603	2,838	54.8	3,204	57.2	2,337	2,399	— 2.6	252	282
Diamond Alkali	76,673	80,749	11,803	19,984	6,341	53.7	13,310	66.6	5,462	6,674	—18.2	1,275	1,484
Dow Chem.	441,779	385,731	94,089	121,890	60,503	64.3	83,415	68.4	33,586	38,475	—12.7	9,284	8,340
Du Pont	1,613,036	1,545,653	593,745	591,984	369,680	62.2	371,240	62.7	224,065	220,744	1.5	68,311	61,647
Hercules Powder	181,517	216,849	32,116	43,926	20,898	65.1	30,270	68.9	11,218	13,656	—17.9	2,687	4,169
Hooker Electrochem	36,524	39,686	8,866	10,507	5,835	65.8	6,950	66.1	3,031	3,577	—15.3	731	775
International Minerals & Chem.	88,453	72,989	9,670	9,495	3,000	31.0	3,074	32.4	6,670	6,421	3.9	656	670
Mathieson Chem.	147,110	91,234	21,494	21,628	7,941	36.9	11,975	55.4	13,553	9,653	40.4	4,673	1,896
Monsanto Chem.	240,747	275,920	41,277	62,121	18,088	43.8	38,643	62.2	23,189	23,478	— 1.2	7,109	6,791
Newport Industries	17,095	22,518	1,296	4,741	263	21.8	2,691	58.0	1,033	1,952	—47.1	264	422
Nopco Chem.	18,079	22,551	2,259	3,322	1,414	62.6	2,231	67.1	845	1,091	—22.5	276	265
Penn Salt Mfg.	57,484	47,555	6,264	10,173	3,046	48.6	6,395	62.9	3,218	3,542	— 9.5	881	393
Pittsburgh Coke & Chem.	38,700	48,663	2,276	9,800	113	5.0	6,707	68.4	2,163	3,093	—30.1	737	654
Rohm & Haas	105,772	106,896	15,516	21,620	10,114	65.2	14,899	68.9	5,402	6,721	—19.6	1,595	1,381
Union Carbide & Carbon	956,931	927,520	227,308	268,386	128,988	56.7	164,496	61.3	98,321	103,890	— 5.4	27,581	28,936
Vick Chem.	56,842	53,146	9,069	9,548	5,036	55.5	6,182	64.7	4,033	3,366	19.8	478	505
Vistor Chem. Works	35,653	32,692	5,443	7,180	2,800	51.4	4,300	59.9	2,643	2,880	— 8.2	733	747
Virginia-Carolina Chem.	75,112	73,034	8,164	10,671	3,821	46.8	5,000	46.9	4,343	5,671	—23.4	154	317
Company Total:	5,350,222	5,262,240	1,259,715	1,467,213	730,300	58.0	913,155	62.2	528,932	551,877	— 4.1	160,819	137,894

* 1951 taxes have in some cases been subject to revision.

Notes: American Agricultural Chem., Davison Chem., Virginia-Carolina Chem., and Pennsylvania Salt Mfg. fiscal year ends June 30. American Cyanamid's earnings for 1951 include a nonrecurring dividend of $5.88 million from Southern Alkali Corp. Davison's company earnings are exclusive of certain income credits. Dow's fiscal year ends May 31. Mathieson's returns include E. R. Squibb for three months only in 1952; its 1952 taxes include $1.8 million of deferred taxes after deduction of $1.9 million restoration of a portion of the prior year's provision for federal profits tax. Monsanto's sales figures are exclusive of its British and Australian subsidiaries. Pittsburgh Coke & Chem.'s 1952 taxes include a $1.03 million refund. Rohm & Haas's 1951 earnings include $656,000 of nonrecurring income resulting from tax refund claim filed in earlier years. Hooker's fiscal year ends Nov. 30.

Net Profits: Starting to Climb Again?

Most chemical companies registered slightly higher sales figures in 1952; lower taxes and pre-tax earnings.

After a poor first half, "anticipated substantial recoveries" began to materialize—then tapered off somewhat.

Steel companies were not alone in being staggered by the nation-wide steel and oil strike last year. Chemical companies, many of which had looked for recovery in 1952, also felt the pinch. (Heavy chemicals suffered directly; plastics and intermediates only indirectly.)

Other Adverse Factors: Adding to the general discomfort, higher wages, heavier freight charges, costlier raw materials and Federal curtailment of electric power chipped into sales increases. Result: a sag in net profits.

The "evils of scare buying" and a growing accumulation of inventories carried over by customers from '51 largely accounted for Monsanto's 12% drop in total sales, along with a general down-turn in textiles and a slowing-up in the detergents market.

Union Carbide sales moved up for the third consecutive year, increasing about 3% over '51. But costlier labor and materials, and increased charges for depreciation and amortization on the corporation's expanded production facilities (its 1952 expenditures of $151 million was the largest in its history) forced income to decline.

Du Pont's sales peak was also topped—the result of product expansion—but its normal and excise profits taxes ate into the gains of the new plants and processes to the tune of 82% of earnings.

A Bitter Pill: Still hard for many companies to swallow was the continuing effect of EPT on "growth and efficiency." By striking at new developments and expansion, the tax put a major penalty on growth and reduced funds for reinvestment—besides dampening the incentive to invest.

Droughts and power shortages in some areas bit into production goals, contributed to decreased earnings.

Brighter Ahead? But Mathieson Chemical set new records in all three categories—production, sales and net income—for the fifth consecutive year. Net income soared a sizzling 40.4%.

Credit for the leap is officially given to process improvements and plant expansion started in previous fiscal years which came on-stream in '52. But merger with Squibb (Oct. 1) was a shot in the arm tax-wise. (Taxes dropped 18.5% in '52.)

Expenditures for capital improvement in a number of other companies are bound to swell sales figures in '53 when $1 billion more of Government-certified expansion comes in.

Meanwhile, preliminary totals for the early months of '53 indicate that business in the chemical industry is off to a rousing start. Sales are already away ahead of Jan. and Feb. of last year, and barring severe cutbacks in government spending should barrel on into the summer in record style.

Natives for Persuasion

As chemical and allied industries get bigger, they become an ever more tempting target for state tax bills.

Up to now, makers and distributors of chemical products haven't had trusted spokesmen at state capitals.

Because state law-makers view "outsiders" with suspicion, why not approach them through "native sons"?

Next week in Chicago, delegates to the annual meeting of the National Sanitary Supply Association will hear from an executive who has this warning for the drug and chemical industries: protection is needed against a new danger.

That danger, says President W. S. (Bill) Jessop, of U. S. Sanitary Specialties Corp., is from discriminatory, injurious and over-zealous legislation in each of the state capitals.

Here's how they do it in Missouri: Members are drawn from any firm that makes or distributes drugs, chemicals and allied products. Dues are $15/year, and meetings are held at monthly luncheons, replete with guest speakers. Present membership of about 300 includes presidents, chemists, and intermediate hierarchy. Group has six committees besides its legislative arm.

Jessop, whose own company does business in every state, has had ample experience with wayward law-making bodies. For the past four years, he's been a member of the legislative committee of the Chemical Specialties Manufacturers Association, and during the past two years has headed that committee. He's also on the corresponding committee of the Association of American Soap & Glycerine Producers, and acts in a similar capacity for the NSSA.

Yankee Xenophobia: To be on the lookout for harmful bills before they're enacted into law, Jessop recommends that producers and distributors of chemical and allied products band together in each state and sponsor legislative committees that can speak for the industry and its interests. He cites three reasons for organizing on a state basis:

- At present, each national organization has its own limited range of interests, can't speak for all branches of the industry.
- State legislators look on national groups as "foreigners," even though many of the members may be from their own state.
- It's doubtful that any national organization for our industry has members in all of the states and territories.

There's nothing like the label "native" in dealing with state solons, says Jessop. A roster of committee members is a good thing to show to legislators; they'll recognize those members as respectable citizens and even more important, "every name represents a voter."

Bills, Bills, Bills: Number and severity of new laws affecting the industry make it essential to organize these legislative committees rapidly, Jessop asserts.

"Government has acquired a taste for regulating business. Also, continually mounting governmental budgets, coupled with demands for tax cuts, make any potential new source of revenue look good. Our industry's widely used products appear to be a very juicy plum."

Possibly the worst aspect of the spate of new laws, he continues, is that there's no set pattern; "laws start and stop at state or city boundaries." Trying to comply with rules that vary in every state would almost require setting up a separate department in each state—an extra expense that probably would be prohibitive and might be viewed as obstructing interstate commerce.

No Slick Lobbyist: Use of a paid lobbyist wouldn't be effective, Jessop feels, because such a man often is not trusted by legislators. He thinks lawmakers should be approached by the chairman of the industry's legislative committee, plus the committee's technical advisers, if any, and as many members as possible.

Technical advisers are useful, he goes on, because most bills affecting the chemical processing industries are technical in nature, and legislators usually don't have much technical knowledge. Generally, legislators are glad to get pertinent information from authoritative sources; and sometimes when a state senator or representative has introduced an undesirable bill, he can be pinned down on technical details until he admits his errors and withdraws the bill.

"Our industry's products appear to be a very juicy plum for taxing."

One iota of advice for legislative committees: keep an eye on "eager beaver" freshman legislators who, eager to impress their constituents, introduce as many new bills as they can think of. Sometimes they just copy laws of other states, making it important that each committee be vigilant so that these "bill-happy" solons won't have precedents for detrimental legislation.

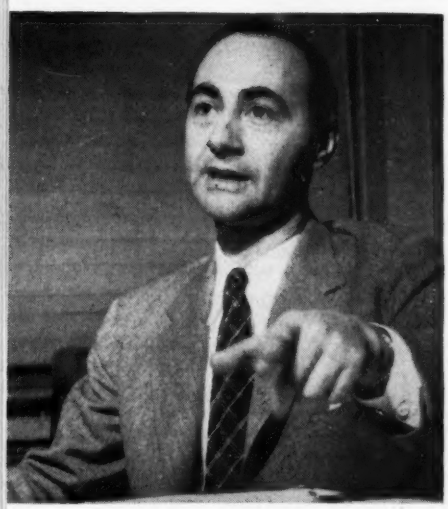
The Helpful Attitude: Cautioning against an always negative approach, Jessop counsels legislative committee members to be sure to give warm support to bills that are in the public in-

"Our committees should get to know legislators on a first-name basis."

terest. In this way, committees can win the legislators' friendship and respect. Legislators will even come to such committees for advice when convinced that the members' opinions are sound and honest, Jessop says.

No Standard Recipe: There's no need for uniformity in setting up these committees, Jessop believes; they should be formed to fit the circumstances in each state. Too much detailed planning could be "stifling"; the committee should come about through a genuine desire for its existence.

Each state group should be autonomous, but should not operate in a vacuum; there should be a full exchange of information among all state and national legislative committees representing the chemical processing industries. Membership should include distributors, local manufacturers, leaders from auxiliary trades such as con-



"A bit of bad legislation in one state can set a dangerous precedent."

tainer and equipment makers, and most important, in Jessop's opinion, local agents of companies whose home offices are in other states.

Committee members should get to know legislators and other officials of both major political parties, "and on a first-name basis as much as possible." The committee's title should include the name of the state to emphasize its "native son" make-up.

It seems certain that, in many states, a legislative committee would be a boon for the chemical industry, with so many vital bills now in the hopper (*CW, Jan. 31*). But there's also a danger that such a committee might do its work too enthusiastically and aggressively, leading to an unfavorable reaction later. The watchwords for successful legislative representatives: diplomacy, discretion, truthfulness.

High Flying Poly

This was the week when the long awaited scramble began. Where there have been two major producers of polyethylene, it now looks as though, come 1956, there will be at least eight in the field. There could easily be more.

Production by the end of 1956 could reach a 550-million lbs./year rate. And the market researchers who quote this figure point out that it includes no expansion by Union Carbide and Du Pont, the present producers, beyond what they already have underway.

Basic reason for the scramble into polyethylene is the court-ordered licensing of patents and know-how of Du Pont and Britain's Imperial Chemical Industries. In the case of polyethylene, ICI owns the basic patent; and it is under this that new producers are being licensed.

The agreement offered by ICI to prospective PE producers includes these items:

Immunity to claims on the basic patent (which expires in April, '56) and to several other auxiliary patents. Technical know-how and design data for a plant, and instructions for operating personnel. For such aid, companies are asked to pay $500,000 in a lump sum, plus a 2% royalty on selling price of polyethylene manufactured in the next 15 years.

ICI estimates that construction and equipment costs for a plant rated at 17-million lbs./year would come to $11 million.

It would be theoretically possible—and a good deal cheaper—to arrange a license covering only the basic patent. The choice then would be either to develop one's own process (involving the too-little-known high pressure polymerization techniques) or to get operating information from Du Pont or Carbide.

Negotiating with ICI is by far the easiest way to get into polyethylene production.

The Line-up: At present, five companies are definitely to be in the field by 1956.

Industry sources generally agree on the names of three others just about to take the plunge.

The 1956 date was selected to allow for the lead time necessary for new producers. Since both Du Pont and Carbide have the know-how for polyethylene production, they could have even further new units in operation well before the end of 1956. Such expansion could easily add another 100 million lbs. of capacity.

Totting up their estimates for the end of 1956, they reach this tabulation of production (million pounds):

Union Carbide	210
Du Pont	100
National Petrochemical	50
Spencer Chemical	50
Tennessee Eastman	20
American Petrochemical	50
Jefferson Chemical	50
Dow	20
Total	550

Other Contenders: There are many other companies that have investigated the polyethylene field. Standard Oil of Indiana, which had a pilot plant operating several years ago, is not running it now.

Allied Chemical's Semet-Solvay division has a plant nearing completion at Buffalo, first product of which is to be a low molecular weight polyethylene wax. Made in low-pressure synthesis, the wax is not covered by ICI's patent. Normally, high- and low-pressure equipment and techniques are not considered interchangeable.

Olin Industries, which went into production of cellophane (and which makes polyethylene sheets) is considered another possible primary producer.

In addition, almost every plastics maker would be a logical producer, from the standpoint of broadening its product line; most oil refiners or producers would have reason to come in, by virtue of raw material supply.

Supply and Demand: But with a prospect of just eight producers in the field, some people are raising questions of oversupply.

In answer, soon-to-be producers cite several contentions: Polyethylene has never been readily available for considerable lengths of time. It has usually been on formal or informal allocation. For this reason, much of its potential has never been gauged.

The price undoubtedly will drop from its present 49¢ level. The average high molecular weight polyethylene, if selling at 44¢ would be competitive with vinyls selling at 38¢. Some of the new or prospective producers are figuring on a 1956 selling price between 35¢ and 40¢.

In general, they feel that there will be some imbalances between supply and demand, but none will be so great that new product development or a lower price couldn't cure.

Future for Fission

Industrial participation in the development of atomic energy, a possibility long imbedded in a legal deadlock, was brought to the fore again last week when Dr. Clarence Larson, director of the Oak Ridge National Laboratory, reminded chemical manufacturers of atomic energy opportunities. Larson* opined that the future of industrial participation in the field depends on a military agreement to release materials and information now under strict control. But only after military needs have been satisfied, Larson added, will the public stand a chance of being included in plans to develop and manufacture fissionable materials.

The main issue at stake legally is the revision of the McMahon Act (the Atomic Energy Act) to define the relative roles of public and private enterprise in the atomic energy field. In the original Act, private ownership of reactors and fissionable materials is prohibited. Reactors have been leased to private concerns for operation, but permission to build them directly has not been granted. As a result, companies have been running atomic energy plants under government contract.

Union Carbide maintains the Oak Ridge Laboratory, while General Electric is the government's agent at the Hanford (Wash.) plant.

Also under contract are several combinations of chemical manufacturers and utilities which are determining the cost of producing atomic power. This has been largely satisfactory; the chemical company operates the process equipment, while the utility has power know-how.

Many companies have shown interest, may start, or continue, to participate in the field. Among them: Dow (already working in cooperation with Detroit Edison under the chemical manufacturer-utility set-up), Monsanto, Foster-Wheeler and Bechtel.

Source of Power: In the event that the field is opened to the public, three possible courses are open to the chemical manufacturing industry, Larson said. Manufacturers and processors could concentrate on utilization of isotopes, exploitation of chemical processes and improvements already developed, or—the most important possibility—harnessing of atomic energy for power.

Larson commented that uranium, as a source of power, may have a potential twenty times that available from present estimated reserves of coal, gas and oil.

Uranium has already been located in many areas of the world. At the present time, deposits in the Belgian Congo and South Africa have been contributing to the United States supply; deposits in Australia and Portugal have also been noted. Private enterprise, he maintained, would permit uranium recovery from many deposits not now exploited.

If the new Administration passes upon some of the suggested revisions of the McMahon Act, international security would be the next problem to face. Clear definition of export controls would have to be outlined. With interest in private participation in the atomic energy field increasing, a decision on the McMahon Art may establish a policy which will decide the future of both peacetime and military applications of atomic energy.

* Speaking at a meeting of the Synthetic Organic Chemical Manufacturers' Assn.

COMPANIES . . . .

Company purchases made news this week:

- The Synvar Southern Corp., Greensboro, N.C., a wholly-owned subsidiary of Synvar Corp., Wilmington, Del., has been purchased by the Barrett Division, Allied Chem. & Dye Corp.
- The Wheatlan Tube Co. (Chemical Div.), Wheatlan, Pa., has been bought by the Chemical & Process Machinery Corp., New York City. Plans call for liquidation of the installation, built in March '49.

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International Minerals and Chemical Corp. has received a 45% quick tax write-off on $500,000 spent for new construction at Wilmington, N.C.

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Cenco Corp., Chicago, Ill., has been admitted for listing and trading on the American Stock Exchange. Wholly-owned subsidiaries of the holding company include Central Scientific Co., Chicago, and the Refinery Supply Co., Tulsa, Okla.

EXPANSION. . . .

Gamma Globulin: Armour & Co. expects to start production of gamma globulin at Bradley, Ill. by May 1. Capacity: around 425,000 cc/month.

Financed by a $423,000 grant from the National Foundation for Infantile Paralysis, Armour will not market the product, will turn it over to an allocating authority for distribution from a national pool.

The globulin operation, according to present plans, will occupy but 20% of Armour's plant site at Bradley to be known as the Armour Pharmaceutical Center. Cost: $12 million—approximately 75% completed.

•

Fuel Oil: Wolverine Pipe Line Co. will build a 16″ pipeline from East Chicago, Ind. to Detroit, Mich. with a link to Toledo, Ohio.

Initial daily capacity of gasoline and fuel oil: 95,000 bbls.; ultimate capacity: 170,000 bbls; cost: $15.5 million.

Completion is scheduled by Jan. 1, '54.

•

Sulfur: Standard Sulphur Co., Rosenburg, Texas, has started taking bids on its proposed $450,000 mining plant at Damon Mound in Brazoria County. Completion of the project is expected within 90 days.

•

Benzene: Shell Oil Co. has brought its multi-million integrated platforming and aromatics extractive distillation plant at Houston into production.

Calculated to add about 10% to the U.S. annual output of benzene, the installation has been described as the largest of its kind in operation in the country. Yearly output: 19 million gallons of benzene and 33 million gallons of toluene. Construction began in May '51.

LABOR . . . . . .

CIO In Spurt: Biggest burst of organizing energy in the chemical field this week has come from CIO unions, still grim about life under a Republican administration. Typical attitude of CIO leaders, urging a speed-up in garnering new members: "The CIO must unite as a bulwark against what is going to happen to us in the next four years."

- Although the United Gas, Coke & Chemical Workers (CIO) won't veer from the stepped-up organizing plan adopted at last fall's convention, the executive board insists that the program be carried out under strict budget limitations. The board asked for and received the resignation of Robert C. Edwards as director of organization, and is supervising a reduced organizational staff until the March 23 board meeting, at which a successor is to be named.
- One partial victory chalked up by Gas-Coke recently is an NLRB order for a bargaining election to be held at the Merck plant in Rahway, N.J., this month. Gas-Coke's petition

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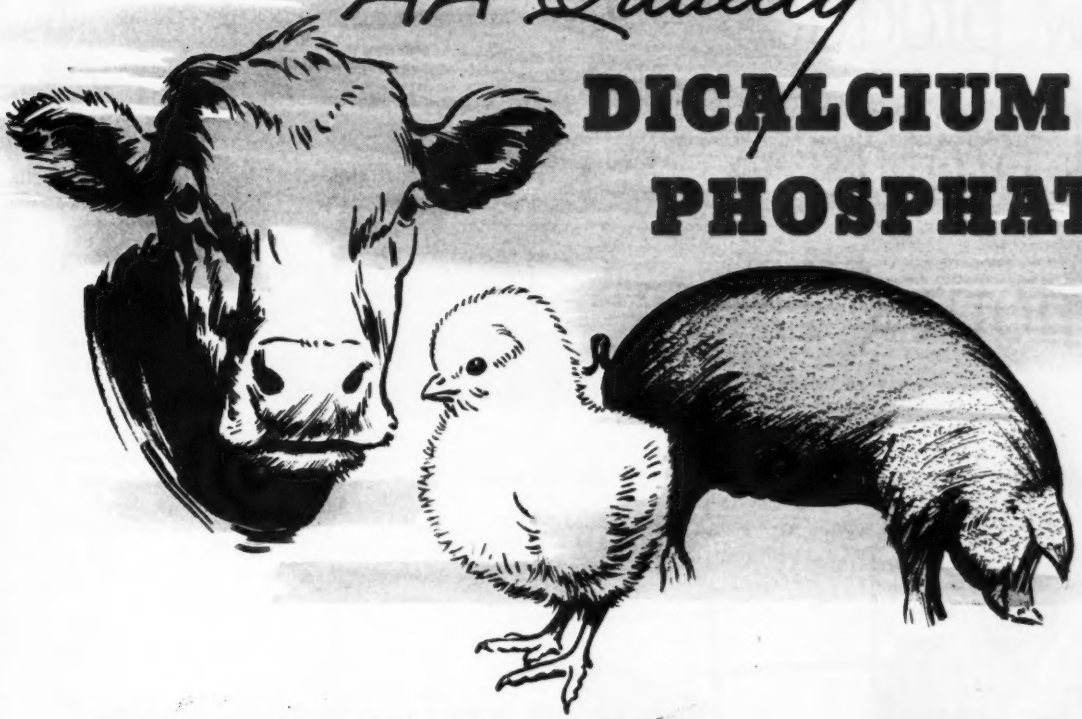

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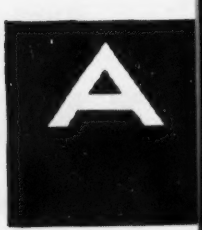
Armour emulsifiers mix oil and water to make profits

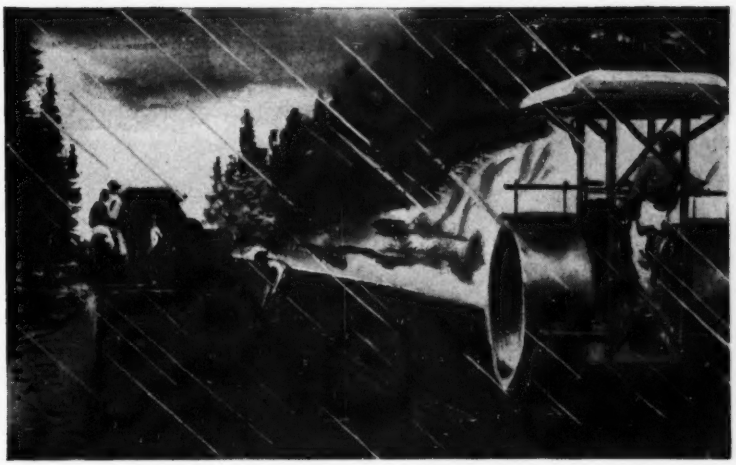
Today, the floor wax market is highly competitive, with new and improved products constantly trying to attract the consumers' attention. First manufacturers introduced no-rub waxes. Now waxes have to be water-resistant and non-spotting to get part of the market. To help solve this problem Armour chemists have developed an emulsifier for Carnauba wax that actually improves the water resistance and non-spotting characteristics of wax.

This new emulsifier is a combination of Ethomeen S/25 and Armac T. Each is an effective emulsifier by itself, but they are more effective for this application when combined. They produce an emulsion that has a permanently water repellent surface immediately upon drying.

In many other fields Armour's wide range of emulsifiers has helped solve similar problems. Emulsions have been most widely used in the past as a vehicle for suspending water-insoluble agricultural chemicals—insecticides, fungicides, etc.—in water for spraying. In recent years other uses have been multiplying rapidly. Today emulsions are used as an improved method for applying many chemicals, and frequently they afford a more economical and safer method of handling these chemicals than is otherwise possible. Application of finishing agents to textiles is a good example. A long bath is all that is necessary, since cationic emulsions tend to exhaust their oil phases on, and bind them to textile surfaces. Wood, animal hair, cellulose and concrete can also be coated because of this cationic action.

Technical Bulletin F-2—"Armour Emulsifiers"—offers a clear and complete picture of Armour's chemicals for the emulsion technologist. It also gives a good idea of many of the fields where emulsions can be particularly valuable. Send the coupon on your letterhead for a free copy of this bulletin.





They're weatherproofing a road in the rain!

Time was when wet weather prevented road laying and repair work. Wet roads wouldn't take asphalt. Now, due to Armour's development of Redicote® and Duomeens® as asphalt additives, it's both economical and convenient to continue laying asphalt on any kind of aggregate or gravel even when they're soaking wet!

The reason? Simply that Duomeens are preferentially adsorbed from oil or solvent solutions onto the aggregate even in the presence of water. In effect, they force the water away from the surface of the aggregate, permitting the asphalt to form a permanent bond. And concentrations of only 0.1 to 1% additive are all that is needed.

The ability of the Duomeens to plate out of a solution onto a metal or similar surface has led to their application as highly effective corrosion inhibitors. They inhibit corrosion from sour crudes in concentrations as low as 2 ppm; they can be used in slushing compounds and silica base greases; and as paint additives they aid in corrosion control of above-ground structural steel exposed to atmospheric conditions.

A new booklet describes the Duomeens and their applications in detail. Another booklet covers the applications of Redicote and the Duomeens as asphalt additives. Send the coupon on your letterhead for free copies of these valuable booklets.

Bubbles with a college education increase ore yields

Froth flotation is a method of separating valuable minerals from crude ore by creating bubbles which attach themselves only to the specific mineral to be separated. By selecting flotation chemicals carefully, ore that would ordinarily be lost can be recovered from tailings. Separations once considered economically impossible can be made. More than one mineral can be separated from a given ore. And, finally, higher grade concentrates are made possible.

This is a modern method of ore concentration, and Armour chemists have kept pace with mining engineers by developing new chemicals which make possible the advances listed above.

Armour's low titer Red Oil — one of seven grades of Armour oleic acid available — is particularly valuable to the flotation chemist. Due to its extremely low titer, this acid is liquid at near freezing temperatures! This eliminates hot rooms — and lowers handling costs! Furthermore, this acid, and our other oleics, are highly resistant to oxidation, which means long storage life without deterioration. Send the coupon on your letterhead for further information and samples.

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Looking Forward

NEW NEO-FAT® FOR ALKYDS

In developing Neo-Fat 280 as an economical material for top-quality non-drying alkyd finishes, Armour chemists were working toward a fatty acid that would parallel present materials, such as commercially pure lauric acid, at a lower cost. Neo-Fat 280 is the answer to the need for such a material. Tough, permanently flexible and non-yellowing finishes are formed with Neo-Fat 280 due to its extremely high purity—it contains less than 1% unsaturated fatty acids!

Other specifications include a titer of 31-36°C.; acid value of 275 to 281; iodine value of 1 max.; unsaponifiable content 0.2% max.; and color, Lov. 5¼", 1R to 10Y max. Average composition is 56% myristic, 37% capric, 4% lauric, 2% palmitic and 1% caprylic.

When properly formulated, applied and baked, Neo-Fat 280 produces pale, uniform alkyds for use in premium white and pastel non-yellowing finishes. And these finishes stay white regardless of age or atmospheric conditions.

They are permanently tough and flexible, and will not embrittle or "check" upon aging. Such properties make for superior enamels used to protect various household appliances—refrigerators, stoves, cabinets and venetain blinds. Alkyds made with Neo-Fat 280 show outstanding resistance to greases, oil, conventional soaps, solvents and other similar chemicals. Send the coupon today on your letterhead for Technical Bulletin A-7 and a sample of Neo-Fat 280.

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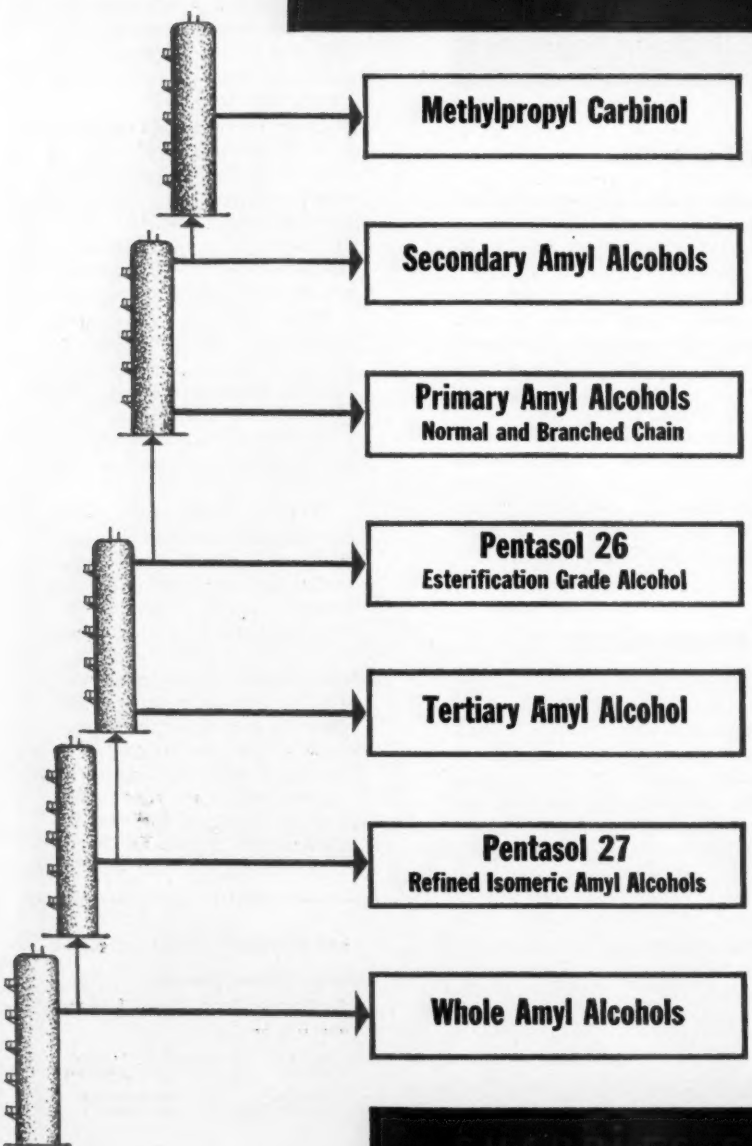

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for an election was opposed by both the company and the Employees Organization Inc., the independent union that waged the 20-day strike at this plant last July. NLRB ruled that the agreement in effect since the end of the strike had not been ratified by the incumbent union's members, hence there was no union contract.

• In nearby New Brunswick, N.J., Gas-Coke won the bargaining agency at the Squibb plant. Of 221 eligible hourly-paid employees, 121 voted for Gas-Coke and 71 for no union. Two ballots were challenged.

• Gas-Coke has one other reason for its chin-up mood this week—a triumph at the Semet-Solvay Division plant in Ironton, O. Voting was 164 for Gas-Coke, 116 for no union.

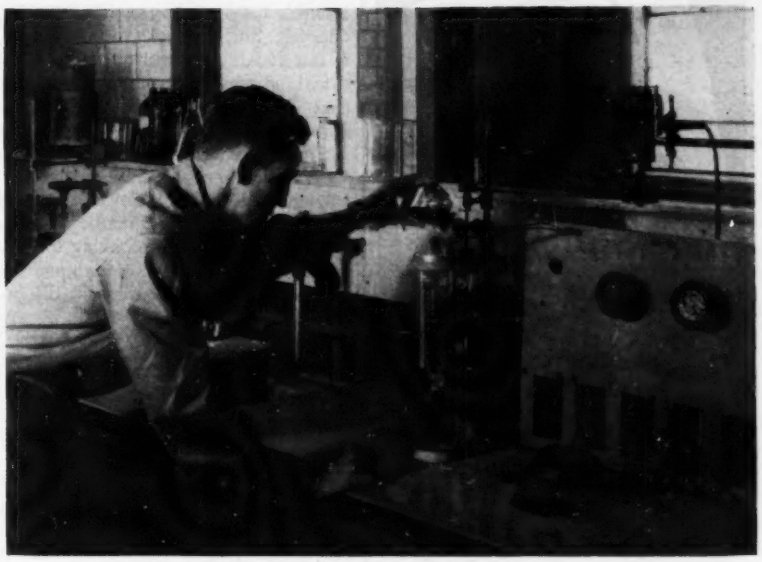
• CIO unionizing efforts ran into trouble at the H-bomb plant on the Savannah River near Aiken, S.C. Two CIO representatives who were handing out literature to employees at the gate were arrested by guards employed by Du Pont, the company that's building and operating this plant for the Atomic Energy Commission.

• Another CIO union, United Rubber Workers, can boast of two victories in recent bargaining elections. At Keokuk, Iowa, employees of Dryden Rubber Co. voted for URW over International Chemical Workers Union (AFL) by 596 to 433; and at Welland, Ontario, URW received 238 ballots compared with 180 for an independent union that formerly represented employees of General Tire & Rubber there.

• In one case, an AFL union has made inroads into United Mine Worker territory. At the National Aniline Div. plant, Buffalo, N.Y., four groups of employees voted to switch from UMW District 50 to the United Brotherhood of Carpenters & Joiners (AFL). Six other bargaining units will stand pat with District 50, and one unit will be polled again in a second attempt to reach a decision. About 500 ballots were cast in the NLRB-conducted election.

• At National Carbide's plant in Ivanhoe, Va., ICWU resisted a "raid" attempt staged by United Gas, Coke & Chemical Workers (CIO). At first, the AFL Machinists also sought to move in on this plant, but withdrew after an NLRB hearing.

• Employees of Armour & Co.'s chemical division at McCook, Ill., have picked ICWU as their bargaining agent, in preference to the CIO Packing House Workers and the AFL Grain Millers.



INDUSTRIAL LAB: House of bondage or hall of freedom?

Chemists In Chains

Whether a new Emancipation Proclamation is needed for chemists and other scientific and engineering employees of chemical companies is a favorite topic of the lively Chicago chapter of the American Institute of Chemists.

In an attempt to keep formulations and processes out of the hands of competitors, many companies have adopted a practice of including in personnel contracts a clause specifying that the chemist may not take a job with a rival firm after leaving his first employer. This not only keeps the trade secrets at home, say some critics, but it also keeps the chemist who signs such a contract in a kind of involuntary servitude.

Clauses Can Backfire: One point brought out in the chapter's recent meeting on this subject is that a "restrictive covenant" can boomerang against the employer and practically force him to divulge in court the very information that he wanted to keep secret.

This can happen, according to Professor Fred Herzog of Chicago's Kent College of Law, when the employer sues a former employee who has bolted to a competitor. The first employer asks the court to keep the chemist from working for the competitor, and the chemist, backed by lawyers for the competitor, contends that the restrictive clause shouldn't be applied because both companies have been using the same process. The first employer then must either drop the suit or disclose his own process to prove that it's not the same as the competitor's.

Some companies, Herzog believes, have hired chemists from other concerns for the purpose of getting inside information, either directly from the chemist or through the court maneuver of claiming usage of the same process.

What's "Unfair"?: When cases of this kind come up in court, the judge usually tries to keep a balance between two considerations: reasonable protection to the company on its technical know-how, and freedom for the individual to improve his economic status by moving to better jobs. But then the lawyers can argue endlessly as to what is "reasonable" in any given case.

A Massachusetts court has framed these criteria for judging the validity of such a contract: Is the purpose fair and conscionable? Will it harm the employee more than it will help the employer? Will it hurt the public? A Texas court asks whether this restraint on a former employee is "necessary for the business," and in many courts the first employer must prove "irreparable injury" before such a covenant can be enforced.

In some businesses, employers have been able to enforce restrictive covenants in their own localities; for example, a Kansas physician got a court to enforce a contract forbidding his former assistant to practice within five miles of the older doctor's city. But as another speaker pointed out at last

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month's meeting of the Chicago AIC chapter, the chemical industry today is not local; competition is on a national or even international basis, so that if such a clause is binding anywhere it's binding nearly everywhere.

Standard Contract Wanted: To the individual chemist, these clauses are extremely distasteful. For one thing, it tends to block his economic progress by limiting his field in looking for new jobs. Also, a contract containing this clause indicates a measure of distrust and suspicion between company and chemist. And the chemist figures that if he did go to court and have the restrictive clause annulled, he'd be branding himself as a troublemaker and other companies wouldn't want to hire him.

One speaker plugged for a standard contract for chemists, and suggested that AIC might spearhead the drive to get the industry to adopt a uniform contract that would be fair to company and chemist.

This contract, he recommends, should contain a clause making any dispute over future employment subject to arbitration, which is usually quick, inexpensive and just. Litigation is not for the poor man, he warns the chemists; a single case can cost as much as $15,000, and may run six months or more before a verdict is reached.

For Self-Defense: In most instances, according to one lawyer, an employee can't be enjoined from going to a competitor unless the first employer can prove that the employee actually learned vital techniques in his plant or laboratory. But dread of litigation impels many chemists to accept contract terms meekly. Numerous companies require such contracts ("no contract, no job"); and some people feel this is particularly unfair when the chemist is only one among hundreds of researchers in the same company—each chemist knows only a small part of the whole process, but is "tied to his job" just the same. Some courts will go so far as to enforce these covenants even in the case of an employee who has been fired.

What can the chemist do to protect himself from this limitation? One bit of advice from Herzog: "Don't sign the contract; if you're a good chemist, the employer may not insist on including the restrictive clause." Or, before you sign, show the contract to a lawyer and find out how enforceable it is. The general contract principle of "consideration" may be cited in defense against an employer's suit; the chemist may argue that he hasn't received anything of equivalent value in exchange for giving up part of his freedom to change jobs. One employer protected himself on this point by paying a trusted employee 50% more salary than he asked for.

Evidence of the Chicago AIC chapter's interest in this cause is the part it played in the recent squabble between research chemist Thomas J. McNaughtan and Durez Plastics & Chemicals, Inc., of North Towananda, N.Y. When McNaughtan tried to switch from Durez to Borden's Durite Div., McNaughtan sued Durez for alleged damage to his reputation and Durez sued McNaughtan for breach of contract (*CW, Jan. 17*). At the prompting of its Chicago chapter, AIC intervened; both law suits were dropped and McNaughtan got the job he wanted with Durite.

As of now, sentiment seems to be turning against the use of restrictive covenants. Some states (Michigan, Oklahoma and the Dakotas) have outlawed them, and the U. S. Supreme Court has said that covenants can't be enforced blindly; each one has to be proved on its own merits. If the shortage of scientific and engineering personnel becomes increasingly acute, as has been predicted, many companies may abandon the use of such clauses in personnel contracts and rely on patent law and equity courts to guard their inner secrets.

Friend in Need

The Foster Parents' Plan for War Children, through a gift from Lederle Laboratories Div., American Cyanamid, recently distributed 125,000 multivitamin capsules to England, Belgium and Holland as part of the flood relief program. The pills, included in a shipment of other emergency supplies, were the second gift of vitamins from Lederle; the first delivery of ½ million capsules was made last year.

Foster Parents' Plan reports that these have been the only donations of their kind in the pharmaceutical field.

Undulating Tariffs

Makers of paints, pigments, insecticides and other chemical products will closely watch the progress of a "sliding scale equalization" tax on imports of lead and zinc recently proposed by Phil Bradley, Jr., head of the mining committee of the San Francisco Chamber of Commerce.

Surviving under heavy imports of metals at lower prices without discouraging free international trade has been a problem facing the lead- and zinc-mining industry for quite some time. A sliding scale equalization tax would bolster the prices of lead and

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Perhaps you need an economical thickener—a two to three per cent solution of high viscosity Methocel will thicken water until it will hardly pour. If you are a manufacturer of cosmetics, latexes, water paints, paint removers or textile printing pastes, you will find it especially useful.

The tough, flexible film formed by Methocel makes an ideal material for capsules, greaseproof packaging and coatings. As an emulsion stabilizer, Methocel acts as a protective colloid and minimizes the settling and caking of dispersed solids in aqueous systems.

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zinc but would promote a more continuous system of free competition.

The problem, as stated by Felix Wormser, vice-president of the St. Joseph Lead Co. (New York), is that whenever domestic market prices of lead and zinc fall below the prices "required to perpetuate the domestic mining industry," (a "base" price level to be established) a sliding scale tax would be levied on imported metals at a rate of 1¢/lb. for each one cent the market price is below the "base" price—to a maximum of 5¢/lb. This plan, Wormser avers, "would have the virtue of being automatic in operation, requiring no payments from government; would observe the cardinal requirement of least interference with a free market; and would afford the mining industry a continuity of operation it does not now possess."

Bradley observed that "the sliding scale import taxation plan could in principle be projected into remaining fields of critical and strategic materials"—a principle that chemical manufacturers, particularly of synthetic organics, who have long been clamoring for greater protection against foreign competition, may consider worth investigating.

LEGAL . . . . . .

Excuse It, Please: In the belief that they were owned by German citizens, certain "chromanizing" patents and property were seized by the U. S. Office of Alien Property during World War II. As of now those assets are back in the hands of Metal-Gas Co., Ltd., which succeeded in convincing OAP that it had bought the patents in 1936. OAP's explanation for the erroneous seizure 11 years ago: "Our information was out-dated."

•

Penalty Box: Like a hockey player who's put out of the game for a few minutes after a foul, a New York exporter has been placed in a kind of business "penalty box" on pleading guilty to fraudulent shipment of chemicals. The Hillard Corp. has been deprived of export privileges for two years after being found guilty of sending "worthless clay" to Hong Kong customers in place of sodium hydrosulfide, a bleaching agent.

•

Quick on the Draw: Law suits on patents usually are slow-moving, but if one pending this week in U. S. District Court in Wilmington, Del., proceeds as rapidly as it started, it'll be a whirlwind. In just a couple of hours after Permutit Corp. of New York was issued a patent on making of halomethylated vinyl-aromatic copolymers, Rohm & Haas Attorney Arthur G. Connolly rushed into the court a complaint alleging infringement of a Rohm & Haas process patent.

•

More Muscle: The U.S. Food & Drug Administration, hoping to win the confidence of the new Congress, has been putting more muscle into its current operations. Commissioner Charles W. Crawford says his men are particularly hot on the trail of "quacks" who have been "victimizing the public" with cancer nostrums. Other recent FDA developments:

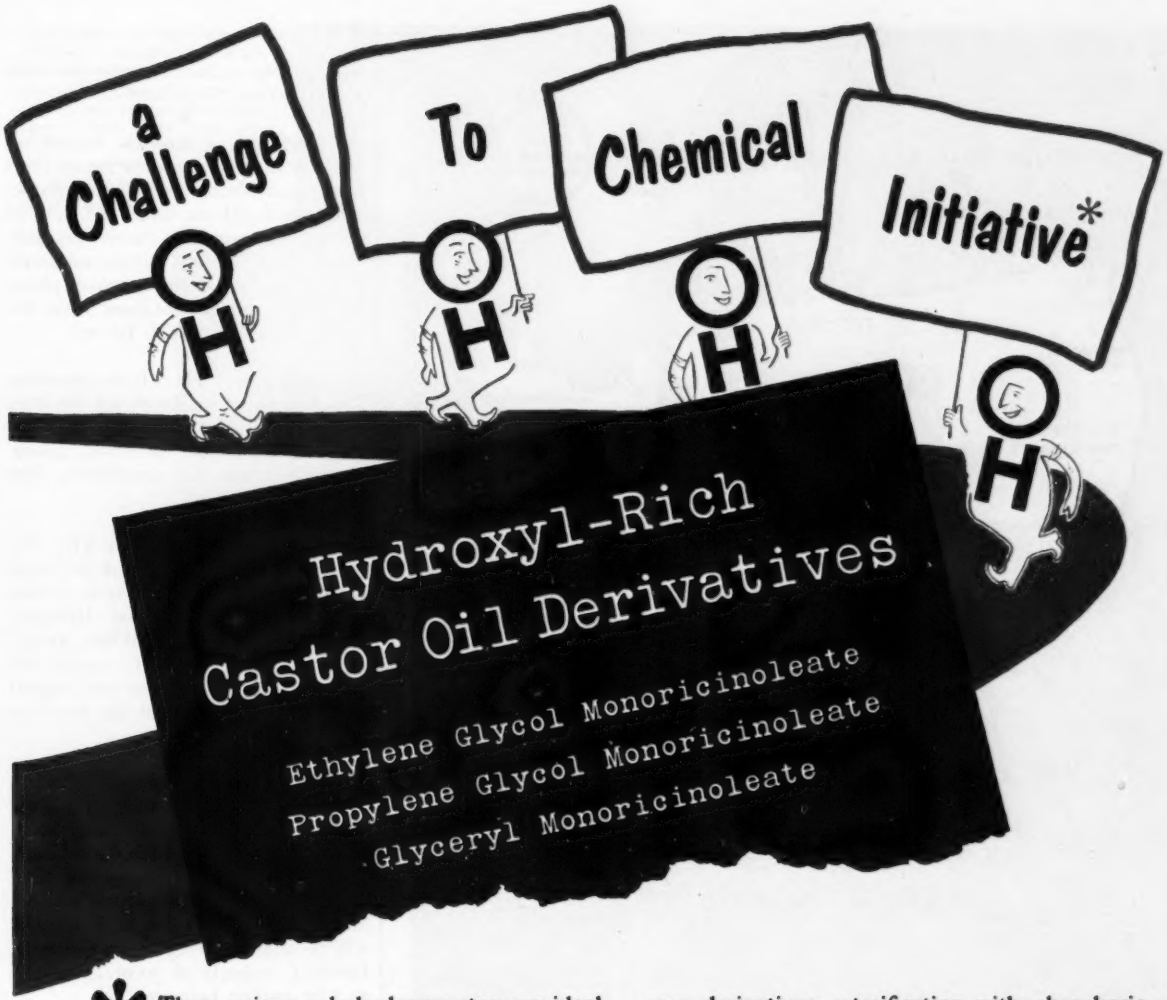
- Search warrants and special writs might be used in a few cases to compel companies to permit FDA inspectors to check on violations, but this would be an "unwise" departure from FDA's successful "positive approach" that promotes active cooperation by manufacturers. So says Law Professor Thomas W. Christopher of Emory University, Atlanta. He favors amendment of the Foods & Drugs Act to authorize the entry of inspectors as a matter of right.
- In New York, a federal grand jury has indicted as "butterleggers" a company and three individuals accused by FDA of processing oleomargarine so that it could be sold and used as butter.
- FDA orders Mueller Hair Experts, Houston, Tex., to cease advertising that its products will prevent or overcome baldness.
- FDA insists that if C. G. Whitlock Chemical Co. of Springfield, Ill., continues to sell its "Frigid-O-BG" as an antifreeze for internal combustion engines, it must state on the label that this preparation "will rust and corrode the cooling system, clog the passages, and otherwise damage the engine."
- FDA turns down the Dolcin Corp., New York, on its appeal from an order that Dolcin stop advertising that its drug preparation is economical and inexpensive "unless and until the retail price shall be less than the price of its only active ingredient, aspirin."

FOREIGN. . . . . .

Sulfur/Brazil: National Sulfur Co., Ltd. (ENAL), has opened its sulfur plant at Rio Maina, State of Santa Catarina, with the financial aid of 12 southern coal-mining companies, a fiber and paper company in Rio Grande do Sul, and a chemical concern in Porto Alegre.

Initial daily production: 6-8 metric tons. Estimated production within 3 months: 30 tons/day.

Output from the plant, reportedly,



* These unique poly-hydroxy esters are ideal starting points for synthetic conversion. Possible reactions of these multi-hydroxy esters are sulfation, acylation, iso-cyanate coupling, acetalization, oxidation, amination, condensation with urea derivatives, esterification with phosphoric acid.

The presence of the polar hydroxyl group suggests their use as surfactants, cellulosic plasticizers, dye carriers, lubricants, and cosmetic ingredients.

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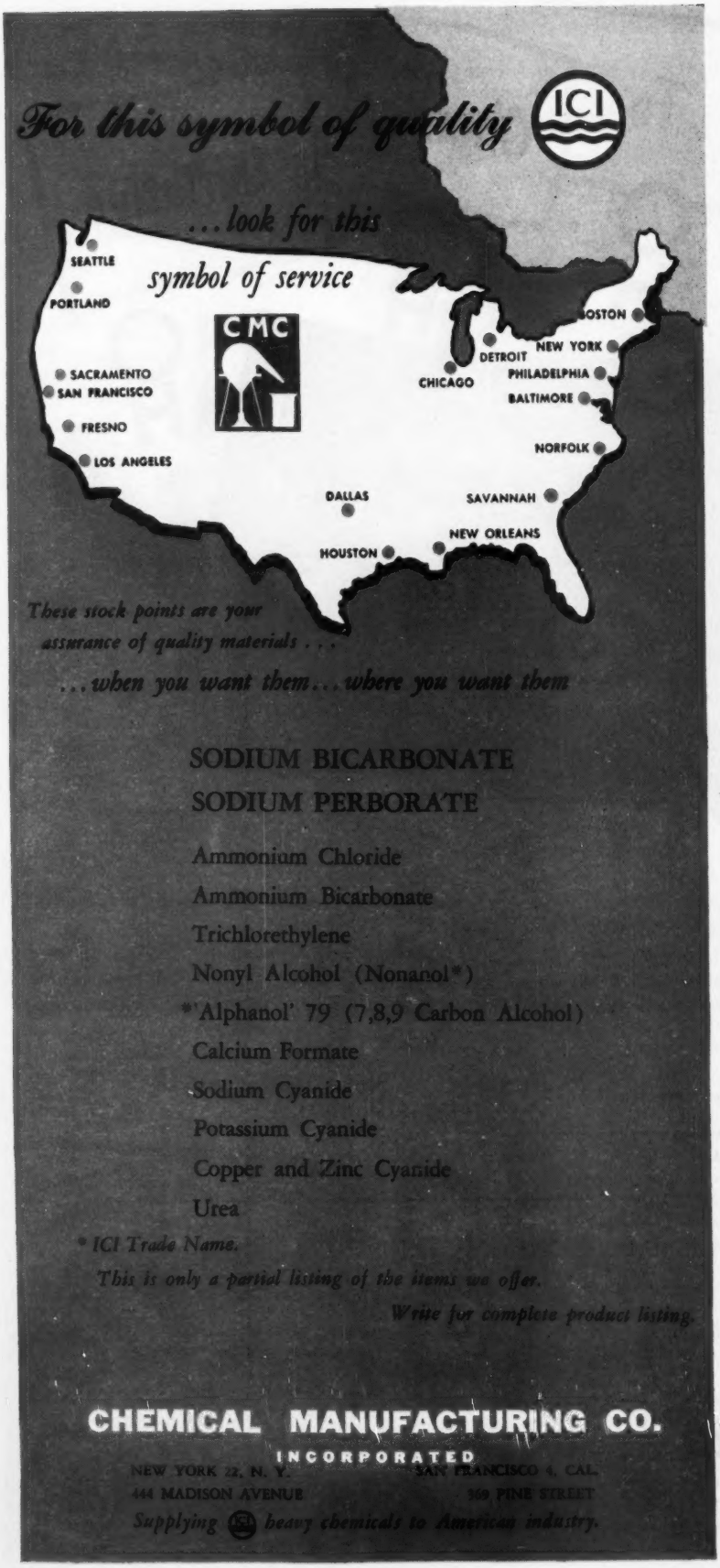


B&I . . . . . .

will reduce sulfur import from the United States, Italy and Chile.

•

Oil/Australia: Australia's largest oil refinery is under construction at Geelong, near Melbourne. With completion scheduled for mid-1954, annual output is expected to exceed one million tons of various petroleum products annually. Under present plans, crude oil will be obtained from the Seria oilfield of British Borneo.

•

Furfural/Italy: The Termodinamica Co. is building a factory for the continuous extraction of furfural from exhausted olive cake in Gioia Tauro. Estimated date of completion: late 1953.

•

Glass Fiber/South Africa: The first glass fiber to be produced in South Africa has gone on stream in Johannesburg. Producer: Glass Development Corp. (Pty.), Ltd. While present output is able to meet current demand, further expansion and capital outlay is anticipated in the near future.

•

Paint/Venezuela: Fábrica de Penturas Tucan has recently started large scale production of paint. Its next step: erection of a varnish factory beside the present plant. It is expected that, when both are in full production, domestic paint production in Venezuela will be able to satisfy home demands. In 1951, imports of paint amounted to 12½ million bolivares.

•

Diphenylol Propane/Netherlands: The N. V. Koninklijke Zwavelzuurfabrieken v.h. Ketjen, Amsterdam, is building a plant to produce diphenylol propane, an intermediate for the epoxy resins which are themselves to be manufactured by the refinery of the Bataafsche Petroleum Mij. (Royal Dutch Shell Group), Pernis.

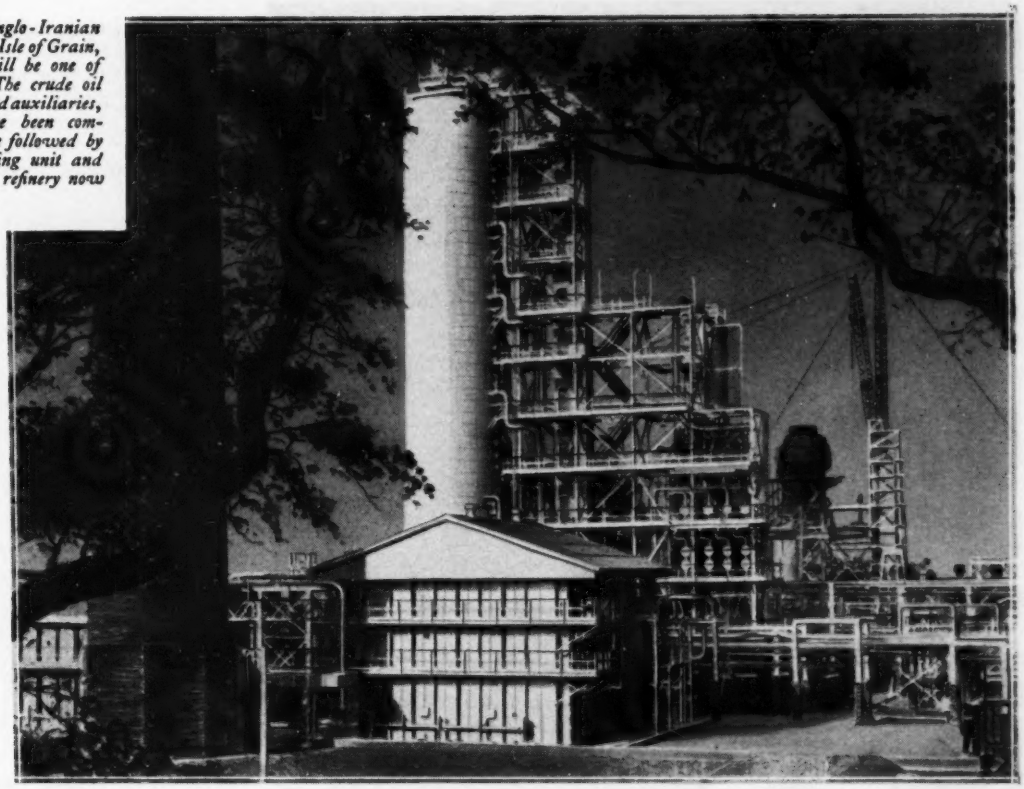
•

Ammonium Sulfate/Pakistan: The Technical Cooperation Administration and the Pakistan Industrial Development Corp. are reported to have negotiated an agreement for building a 50,000-ton ammonium sulfate factory near Daudkhel. The corporation already has under construction a 3,500-ton caustic soda plant at Nowshera, and is planning a superphosphate plant in conjunction with a sulfuric acid factory at Lyallpur.

•

Superphosphates/Turkey: A joint stock company has been formed to set up and operate a superphosphate plant in Iskenderun with the cooperation of the Fertilizer Corp. of America. Initial production is estimated

Kent Refinery of Anglo-Iranian Oil Company on the Isle of Grain, below London, will be one of Europe's largest. The crude oil distillation plant and auxiliaries, shown here, have been completed and will be followed by the catalytic cracking unit and the lubricating oil refinery now under construction.



PLACING RESPONSIBILITY *to* BEST ADVANTAGE

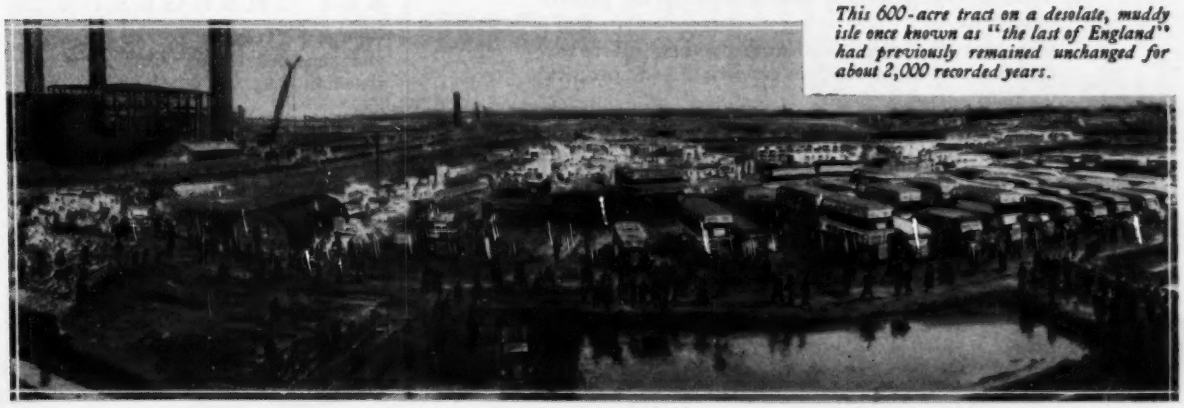
Work of the size and complexity of the new Kent Refinery, incorporating the latest technical developments, requires control and leadership woven together detail by detail.

The Anglo-Iranian Oil Company determined products and processes, then placed the design of certain process units and the overall planning and erection management of the complete refinery in the hands of E. B. Badger & Sons Limited, affiliated with Stone & Webster Engineering Corporation.

The coordination of advance planning, scheduling and construction management on a realistic pattern is a sphere in which the organization has long excelled.

STONE & WEBSTER ENGINEERING CORPORATION
BADGER PROCESS DIVISION

This 600-acre tract on a desolate, muddy isle once known as "the last of England" had previously remained unchanged for about 2,000 recorded years.



Oklahoma legislators—both in and out of session—are constantly working to improve Oklahoma's economic climate for industry. The Legislature now in session has undertaken the ambitious program of enhancing still further the state's industrial acceptability, a major point of which is *no increase in taxes!*

The record of Oklahoma's business-like approach to government, augmented by its two-party system, speaks for itself:

1. A healthy financial surplus.
2. A balanced budget at all times.
3. No tax increases on industry since 1941; in fact, both corporate and individual income taxes were reduced in 1947.
4. True appreciation of the problems of private enterprise.
5. Constant expansion and improvement of roads, schools, and other services essential to the peoples' welfare.

In Oklahoma you'll find the keynote of sound business and *profitable industry* to be a hard-working legislature sensitive to the needs of expanding business and industry. Your future is in Oklahoma — come on in! The Government is fine!

Note: For a special report on how Oklahoma's legislation affects *your* business, write immediately. Your inquiry will be kept in strictest confidence.

Make More Money IN OKLAHOMA

B&I . . . . . .

at 100,000 tons annually, is scheduled to get rolling before the end of 1953.

•

Superphosphates/Japan: Two superphosphate plants in Japan are now ready to go into production, with the trial operation successfully completed. One plant was purchased by Toyo Koatsu at Sunagawa, Hokkaido; the other, by Konoshima Chemical Industries Co., Sakaide, Shikoku. Builder: Bradley Pulverizer Co., London.

•

Tin/Netherlands: A chemical works at Schiedam is now producing tin, tin-lead alloys and cadmium in powder form. In the near future, zinc powder will also be manufactured.

•

Cellulose Acetate/Japan: A contract for establishing the nation's largest Japanese-American jointly managed chemical fiber plant has been initiated between the Mitsubishi Rayon Co. and Celanese Corp. of America. Projected plant capital: 2,000 million yen. Monthly production: 300 tons of cellulose acetate.

•

Ammonium Sulfate/Turkey: Badische Anilin-und Sodafabrik (BASF), in cooperation with another West German firm, is building a plant in Turkey, expected to produce annually 50,000 tons of ammonium sulfate, 15,000 tons of ammonium sulfate nitrate, and 3,000 tons of nitric acid.

•

Naval Stores/Indonesia: Indonesian authorities are now engaged in rehabilitating local resin and turpentine industries. Work has progressed particularly at Takengon, North Sumatra, at a cost of 37 million Indonesian rupiahs. Production figures approach 100 tons/month. Future plans call for the construction of a caustic soda plant, valued at seven million rupiahs, at Waru. Estimated date of production: early 1955.

KEY CHANGES . . .

George E. Temple: To vice-president and general manager, Catalytic Construction Co., Sarnia, Ontario, Canada.

Ross E. Roberts: To vice-president, Pyrofax Gas Co., a division of Union Carbide and Carbon Corp., New York, N.Y.

Thomas C. Keeling, Jr.: To president, Mathieson Hydrocarbon Chemicals Div., Mathieson Chemical Corp., Baltimore, Md.

John S. Gates: To treasurer, Foote Mineral Co., Philadelphia, Pa.

Hudson foresters choose a stand of prime timber for multiwall Kraft from Hudson's 435,000 acres. They practice selective harvesting, always leaving parent trees to help with the new crop, by natural reseeding.

Careful selection of trees for mechanized cutting gives uniform quality and dependable supplies of raw materials for pulp making.

Every year about 1½ million southern pine seedlings are planted on Hudson tree farms.

Here is why HUDSON can guarantee Multiwall Sacks against breaking on the packer

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HUDSON MULTIWALL SACKS

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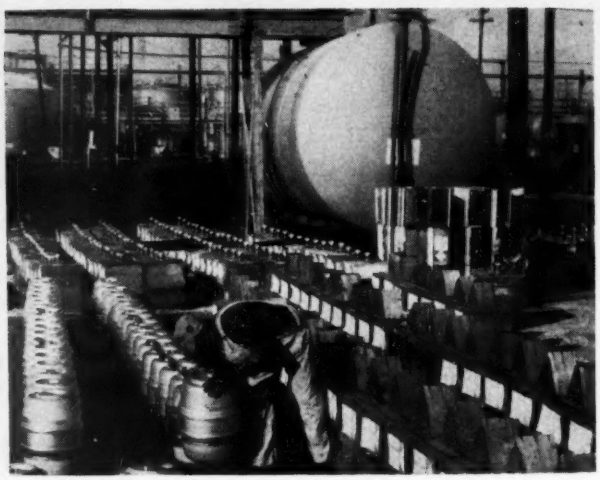


New formula for fertilizers: Take a pile of phosphate rock (left), then add some nitric acid (below).

Nitric Foments a Rock Revolution

YOU'RE PART of an industry expanding at an eye-opening clip. But you're dependent on sulfuric acid; your whole industry, in fact, is the largest single customer for the acid. And you're in the middle of an almost crippling sulfur shortage. To make it more exasperating, you use sulfuric principally because of its acid value, not because it adds much, if anything, to your product. What do you do? You start looking for another acid to do the job.

That was the situation of superphosphate producers just a little over a year ago (*CW, Oct. 6, '51*). They didn't have to look far for another acid either, for European companies had long been making nitrophosphates by acidulating phosphate rock with nitric acid instead of sulfuric as is done in the production of superphosphates. Moreover, Tennessee Valley Authority investigating the European processes since 1948, decided on four that would fit in with American production and marketing techniques (*see next page for boxscore on processes*) and was then—as now—vociferously plugging the idea.

Wheels in Motion: Now, of course, the sulfur shortage is a thing of the past. But the wheels have been set in motion; superphosphate producers, after looking at nitrophosphates, liked what they saw. It's their favorite topic of conversation this week as it has been every week for some time. These are the things they're talking about:

• Big news was Allied's decision last fall to build the $6-million nitrophosphate plant in South Point, O., on which it has just broken ground. Although Allied, with typical reserve, is not disposed to discuss its future plans, it has submitted a proposal to the Defense Production Administration for two more plants, one at Pasco, Wash., the other at La Platte, Neb. Each plant would cost $27 million, would produce 200,000 tons of nitrophosphates a year that would contain 30,000 tons of phosphorus pentoxide and 30,000 tons of nitrogen.

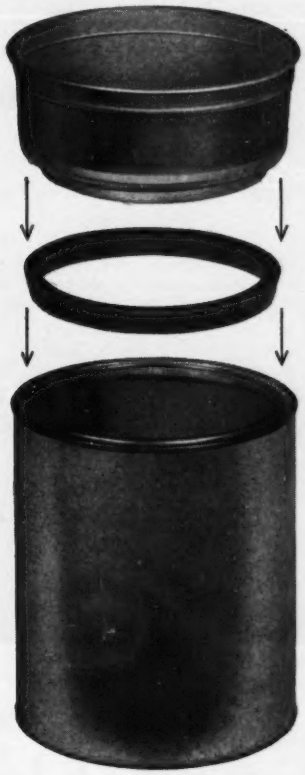
• Gulf Improvement Co. is going ahead with its plans for a $15-million integrated nitrophosphate plant at Pascagoula (Miss.). The firm has told the government it can swing the deal without a government loan. Gulf is the first taker for Chemical Construction's (New York City) nitric acid-ammonium sulfate process (*CW, Apr. 5, '52*).

• Associated Co-op has a 60,000-ton-a-year plant going up at Muscle Shoals, Ala. TVA is building its own plant at the same site. Both will be set up to use the four TVA processes interchangeably.

• Northern Chemical Industries has received a certificate of necessity for a $1.4-million nitrophosphate plant at Sandy Point, Me. Apparently, it will adjoin Northern Chemical Industries' 70-ton-a-day ammonia plant.

Aside from actual plans for construction, research and investigations are being carried out by practically every big name in the industry. International Minerals and Chemical, for

Another new development using AMERICAN ANODE *materials*



Topper made by Fostoria Pressed Steel Corp., Fostoria, O. American Anode supplies the plastisol for the seal only.

Casting plastisol in molds.

Showing infra-red ovens that fuse plastisol, and finished seals.

PAINTERS' DELIGHT!

Leakproof-sealed topper ends splash and mess

IF you've ever mixed colors in a paint can and poured the mixture into a smaller can or roller pan, you know what happens! Here's an ingenious device for painters that helps avoid splashing.

It's a steel topper that fits snugly on standard paint cans. It's easily removable, can be used over and over, gives painters a new working tool.

Important part of this topper is the flexible seal made of American Anode plastisol that forms a leakproof connection between the can and the topper. Result—no leakage when the can is tilted.

And this plastisol seal resists the effects of paint and of constant usage, will last a long time.

It's typical of the many successful products made with American Anode plastisols. For these versatile materials can be coated, cast, dipped or molded. They can be made resistant to heat and cold, abrasion, grease, oil, and many chemicals.

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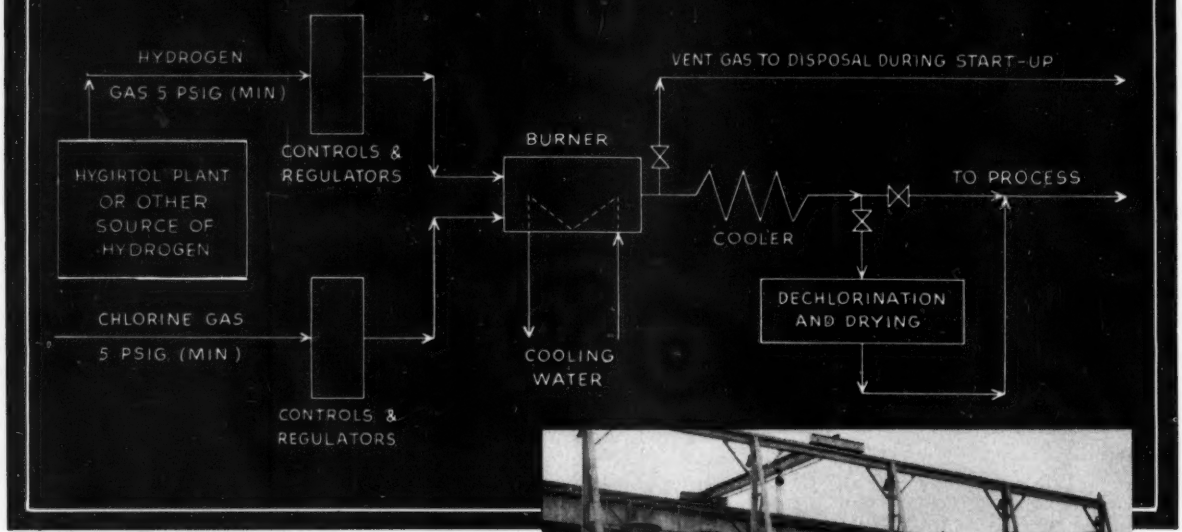
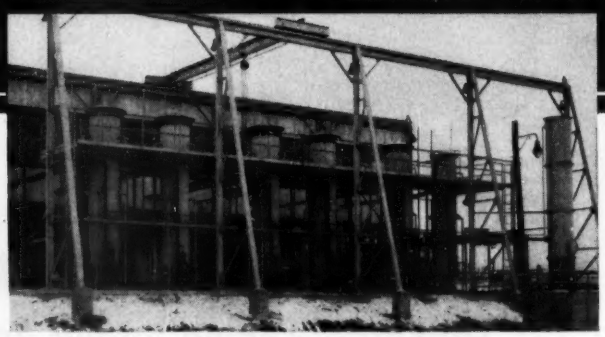


...Girdler designs and builds the plant



THE GIRDLER CORPORATION is a licensing agent for the hydrogen chloride manufacturing process developed by Hooker Electrochemical Co. Girdler designs, builds, and licenses these plants for the production of anhydrous hydrogen chloride from hydrogen and chlorine. The process has proved to be highly efficient, low in maintenance and to give uniformly good yields.

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The GIRDLER Corporation

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GAS PROCESSES DIVISION: New York, Tulsa, San Francisco • *In Canada:* Girdler Corporation of Canada Limited, Toronto

instance, is working on a process, though it's still in the laboratory. A good bet would be that it's investigating a process similar to TVA's nitric acid-potassium sulfate method. Davison Chemical and Mathieson Chemical have studied the various processes, are still interested though noncommitted.

And TVA reports that Mississippi Chemical Corp., Lion Oil Co., Thurston Chemical Co., Darling & Co., Commercial Solvents Corp. and Consumers Co-operative Assn. have approached it on numerous occasions to get process information.

Moreover, TVA is continuing its research on the project. It has completed pilot-plant work on three of the four processes and has started work on the fourth. Now it is constructing small-scale studies and exploratory tests on three modified "solid-phase" processes. The products of these will require curing but can be made—with minor alterations—in conventional superphosphate equipment.

Processes

Despite the interest in nitrophosphates at the research level, there is no lack of commercial processes available. Allied is using its own, but TVA is ready to supply its four to any ready customer. Chemico is selling a "package" that includes ammonia and nitric acid plants. General Industrial Development Corp. (New York City) is licensing the St. Gobain process in this country. And Chemical & Industrial Corp. (Cincinnati) is licensing the processes developed by France's Potasse et Engrais Chimique (PEC).

The idea behind all the processes is the same: simply substitute nitric acid for sulfuric. Actually, however, it doesn't work out quite that easily, for the nitrate radical from the acid teams up with the calcium from the rock to form calcium nitrate. Highly hygroscopic, this salt causes the fertilizer to set (*i.e.*, cake like cement after the bag has been opened for some time). Since farming is a seasonal trade and fertilizer production is not, there are long periods during which caking can occur.

Some European companies bypass this problem by filtering out and selling the calcium nitrate. Although the product can substitute for calcium chloride in some cases, and although some calcium nitrate is imported (notably on the East Coast), it would take a tremendous amount of market development before any such procedure would be economically attractive here.

In any case, TVA decided against

Process Checklist

Substitution of nitric acid for sulfuric and phosphoric acids in the digestion of phosphate rock has been on a commercial footing in Europe for almost 25 years, has been proposed as a means of conserving brimstone in this country. One difficulty is that the complete substitution of nitric results in the formation of large amounts of calcium nitrate. Methods for avoiding this are main basis for variations among the processes.

Here's How:

Tennessee Valley Authority has been researching processes since 1948. It looked over all the foreign processes, decided on four that would be suitable for U.S. producers:

1. Phosphate rock is acidulated with a mixture of nitric and phosphoric acids, then ammoniated. Potassium chloride is added and the product is dried.

2. Phosphate rock is acidulated with a mixture of nitric and sulfuric acids. Steps are the same as in process 1.

3. This process is similar to number 2; the main difference is that the sulfate radical is supplied by potassium (or ammonium) sulfate. Rock is acidulated with nitric, ammoniated, and the sulfate salt is added. Potassium chloride can be added before drying.

4. Phosphate rock is acidulated with nitric, then ammoniated to precipitate dicalcium phosphate, which is filtered off. Treatment of the filtrate with carbon dioxide and ammonia precipitates calcium carbonate, which is separated. Filtrate can be evaporated and crystallized to produce ammonium nitrate.

Here's Who:

In this country all the processes are related to one of the four TVA processes, which, of course, have been borrowed from Europe:

- Chemical Construction is pushing a process similar to TVA number 3. The sulfate salt is supplied in the form of ammonium sulfate, which is regenerated. It's the process that has been proposed for Gulf Improvement Co.'s $15-million nitrophosphate plant in Pascagoula, Miss.
- General Industrial Development (New York City) has licensed a process from France's St. Gobain. Using mixed acids, it's related to TVA process number 2.
- Chemical & Industrial Corp. (Cincinnati) is licensing France's Potasse et Engrais Chimique processes here. They are related to TVA processes 1, 2 and 4.
- Allied Chemical has its own process, which it will use in its South Point, O., plant, and in its two proposed Western plants. It, too, is similar to TVA process number 2.

In Europe:

- The Dutch State Mines and Odda Smeltwerke, Norway, acidulate with nitric, separate, and crystallize calcium nitrate, which they sell as a by-product.
- I. G. Farben has been acidulating with nitric acid since the late '20s. It is similar to TVA process number 1.
- In addition to the mixed acid acidulations, St. Gobain has a process similar to TVA's number 4.
- Imperial Chemical Industries is investigating a process similar to Chemico's.

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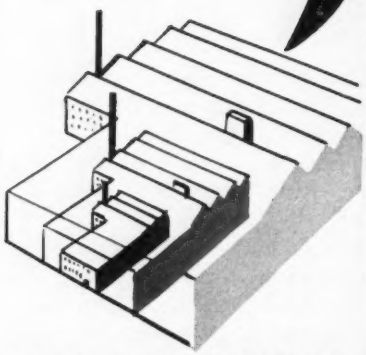
MICHIGAN



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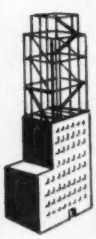

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that, concentrated, instead, on methods that avoid the formation of calcium nitrate. These are the four processes it came up with:

1. Acidulation with a mixture of nitric and phosphoric acids. A plant employing this process would use about one-third the amount of phosphoric acid a comparable plant uses in making triple superphosphate (provided that wet process phosphoric is not used).

2. Acidulation with a mixture of nitric and sulfuric acids. Sulfuric requirements are about half those required for superphosphate production.

3. Acidulation with nitric, then ammoniation and addition of potassium (or ammonium) sulfate. The process is essentially the same as that above, but the sulfate radical comes from a sulfur salt rather than sulfuric acid.

4. Acidulation with nitric acid, ammoniation to precipitate dicalcium phosphate, which is filtered off. Treatment of the filtrate with ammonia and carbon dioxide converts the calcium nitrate to ammonium nitrate and calcium carbonate, which is filtered off.

Since TVA has blanketed the field, most of the commercial processes are closely related to one of the four. Chemico's, for instance, is similar to number 3. In the process, rock is digested with nitric acid, then ammonium sulfate is added to convert the calcium nitrate to ammonium nitrate and calcium sulfate, which precipitates. It's filtered off and reacted with ammonium carbonate to produce calcium carbonate and to regenerate ammonium sulfate. The filtrate is ammoniated, potassium chloride is added and the product dried and granulated.

Chemico starts from scratch and ends with a complete nitrophosphate unit. Its process is aimed for areas having access to cheap natural gas for the ammonia plant and because the process has a high evaporation load.

The St. Gobain process being offered here by General Industrial Development is similar to TVA process number 2. G.I.D., however, adds that it is the only process offering the choice of phosphoric acid when it is desired to enrich the fertilizer's phosphate fraction.

The company is offering a plant, delivered and erected for approximately $800,000. It would have a 50,000-ton-a-year output of 14-14-14* mixed nitrophospate fertilizer (capacity will be higher for 11-11-11, less for 20-20-20). The plant site would be extra, bagging and storage facilities (10,000 to 15,000 tons) would run an additional $300,000, and a nitric acid plant another $1 million. The offer does include trained personnel to get the operation rolling and a guarantee of the figures on cost production and amortization.

Based on the current price of ammonia ($82.50/ton), production costs —including depreciation and interest on capital—would average $47/ton for 14-14-14 fertilizer. Investment capital would be paid back, before taxes, in 12 to 14 months. These figures are based on a Midwest resale price of $80/ton for 14-14-14 complex fertilizer.

Chemical & Industrial Corporation's PEC processes are similar to TVA processes 1, 2 and 4. It is offering a plant, erected and running for $500,000 to $550,000 in this country. This is a 65,000-ton-a-year plant turning out 12-12-12 fertilizer. The offer, however, doesn't include bagging and storage facilities, plant site or nitric acid plant. It does include a guarantee of production cost figures.

Pros and Cons

Although the moving force behind all the activity in nitrophosphates is the prospect of conserving, and at the same time reducing dependence on, brimstone, there are other important questions, none of which can be answered without a comprehensive study in each case.

And even the size of the sulfur saving depends on which process is employed. A firm using Chemico's process, for instance, can—for all practical purposes—eliminate its dependence on sulfur. But a producer using TVA's process number 3 and employing wet-process phosphoric saves no sulfur at all since the wet-process acid is produced by the action of sulfuric acid on phosphate rock. The same producer working off arc-furnace phosphoric would cut his sulfur requirements considerably, but that's practical only in areas where electric power is cheap and readily available.

The most significant aspect of the whole subject, of course, is the economics involved in using nitric acid. TVA, for example, has long held that, for producers with captive nitric acid facilities, its processes turn out the cheapest phosphate fertilizer in the world. Industry, however, is chary of TVA's bookkeeping practices, is quick to point out they aren't always applicable to an industrial operation.

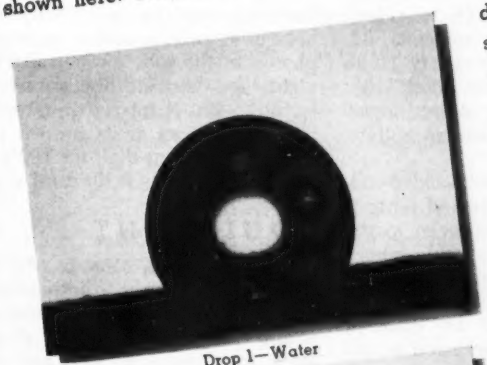
Whatever the operating costs, moreover, the prospective nitrophosphate manufacturer can figure on a relatively large capital investment.

* Percentages in the product, respectively of nitrogen, phosphorous pentoxide, potash.

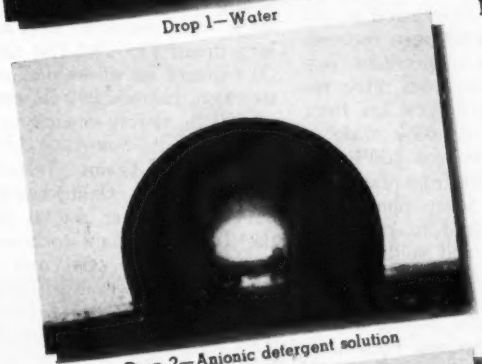
How does TRITON X-100 clean so many surfaces?

TRITON X-100 is a Rohm & Haas non-ionic detergent exceptionally effective as a cleaner for hard surfaces such as aluminum, steels, copper, brass, zinc, iron, ceramic tiles, hard rubber, linoleum, glass and many plastics.

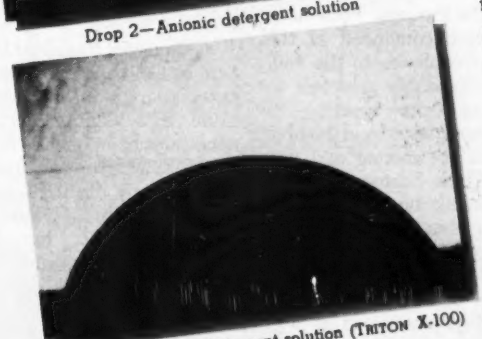
One important reason for the all-inclusive cleaning power of TRITON X-100 is its ability to *preferentially* wet the surfaces it cleans. This phenomenon is graphically illustrated in the micro-photographs shown here. They show a typical substrate (steel in this particular case) completely immersed in oil. Individual drops of anionic and non-ionic detergent solutions have been placed on the steel plate with a micropipette. For comparison —a drop of water is also shown.



Drop 1—Water



Drop 2—Anionic detergent solution



Drop 3—Non-ionic detergent solution (TRITON X-100)

Drops #1 and #2 retain their semi-globular shape—they show a high contact angle between the drop and the test surface. The water and the anionic solution are unable to displace the oil film from the steel surface and therefore their cleaning power is limited.

Drop #3 (TRITON X-100 solution) has flattened out It hugs the surface and shows a low contact angle It is able to wet the surface *preferentially*—it displaces the oil film from the surface and therefore, does a better cleaning job.

TRITON X-100 is such an effective and universal cleaner because its solutions immediately develop a low contact angle with <u>many</u> surfaces; because it quickly wets substrates; and because its solutions readily displace soil from the surfaces; and finally, because TRITON X-100 can be easily rinsed off—leaving a sparkling clean surface.

Further information on test procedures for laboratory evaluation of hard surface detergency is available upon request.

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PRODUCTION

For one thing, he must build his own nitric acid plant. That would mean a minimum capital investment of $2 million, and for a big operation, it could run well over $20 million.

Also, the optimum plant size for a nitrophosphate plant is higher than that for a superphosphate plant. The average-size superphosphate plant is about 40,000 tons a year, while it is doubtful that a nitrophosphate plant much under 60,000 tons would be economically attractive. So, besides the need for continuous operation and more storage facilities, it involves a higher distribution radius, higher freight costs.

A significant insight into the size of the required investment can be obtained from a recent government study which pegged the cost of a plant in Wyoming at $10 million. Production for the plant (in tons/day) breaks down like this: ammonia, 32; nitric acid, 55; sulfur recovery (from sour gas), 35; sulfuric acid, 100; nitrophosphates, 175; other superphosphates, 175; ammonium sulfate, 30.

Adding Value: One decided advantage attending the use of nitric is the fact that it adds nitrogen to the product. Allied's nitric acid expert, E. D. Crittenden,* figures a ton of 65% nitric is worth $38.70 to the fertilizer manufacturer at his plant in terms of acid value (compared to sulfuric) and value of nitrogen recovered. He makes these assumptions: one ton of hydrogen ion from nitric replaces a ton of hydrogen ion from sulfuric; 96.5 tons of 65% nitric is equivalent to 49 tons of 100% sulfuric; nitrogen credit from the nitric acid equals 13.5 tons; phosphorus pentoxide is recovered in the same quality and yield, and sulfuric acid costs $21/ton.

But realizing the full benefits of the added nitrogen would require a new sales policy to the farmers. They have just about become convinced of the value of superphosphates to the soil, would be understandably reluctant to get excited about a new type.

And nitrophosphates would involve other changes in the mixing and distribution end of the business; for, in general, they permit no post-processing variations as does superphosphate. When the nitrophosphate leaves the plant, it's a homogeneous mixture containing as much—or as little—nitrogen, phosphorus and potassium as it will ever have.

Regional Scurry: Phosphate fertilizers are big business (2.5 million tons/year), are promising to get bigger (proposed 1954 output: 3.6 million tons). Present proposals would put a superphosphate plant in each section of the country, but with multi-million-dollar stakes, each region is clamoring for more. Thus, New England, still suffering from the textile industry's migration to the South, is eagerly coaxing prospective nitrophosphate producers to join Northern Chemical Industries in that area.

Out West, fertilizer interest centers on two rivers: Wyoming's Green River (because of its potash reserves) and Washington's Columbia River (because of its potentially cheap power). The outlook there, however, must await the outcome of the power controversy (*CW, Jan. 3*) which is due for an airing before the Federal Power Commission next month.

Like the farmers, fertilizer manufacturers—who for a century have been using sulfuric acid to make phosphorus in the rock more available to plants—are hesitant about switching to nitric. But if interest in nitrophosphates continues at its present pace, they may find out that, for 100 years, they've been doing it the hard way.

EQUIPMENT

Skid Tier: Phillips Mine & Mill Supply Co. (Pittsburgh) is introducing a skid-type materials handling unit, that is also designed for stacking of pipe, angle iron, structural steel and other long items. The Phil-Tier model GC-50 features an all-welded steel construction, has a 4,000 lb. capacity, a 16,000 lb. tiering capacity .

•

Automation Again: Telecomputing Corp. (Burbank, Calif.) has just come out with another digital computer, the Teleducer. Said to have an accuracy of 0.1%, the unit converts analog voltages into decimal digits which can be recorded by punched cards, electric typewriter, magnetic or punched tapes.

• Logistics Research Inc. (Redondo Beach, Calif.) is introducing two new automatic graph followers. The Logrinc is a digital plotter with the necessary components for automatically following curves and converting the data into electrical impulses. The Three Dimensional model is similar to the Logrinc, but designed to handle functions of two variables where the Logrinc will handle any continuous function.

• Minneapolis-Honeywell Regulator Co.'s (Philadelphia) new cascade controller features pushbutton programming. The buttons permit rapid resetting of the controller's motor driven index wherever control pro-

* In *Chemical Engineering*, June, 1952.

If your Lacquer's blushing

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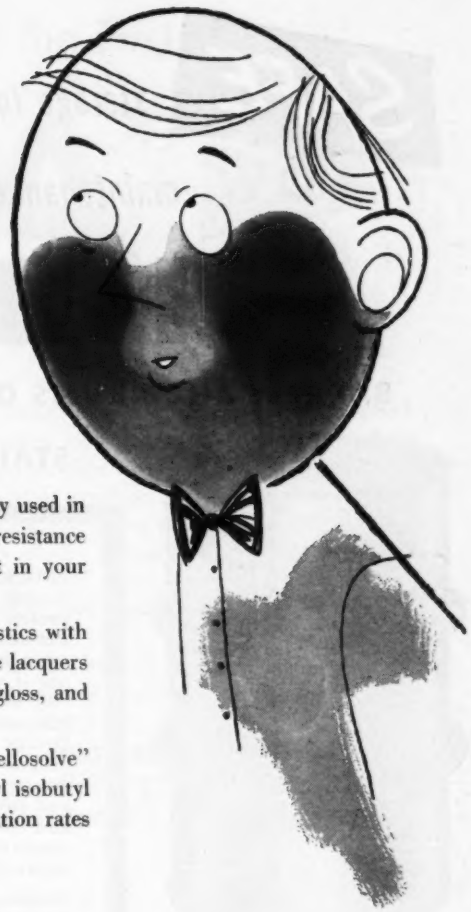

Butyl "Cellosolve" is compatible with all resins normally used in nitrocellulose lacquers. It produces outstanding blush resistance when used in nitrocellulose lacquer formulations. Try it in your formulation—it may eliminate your blushing problems.

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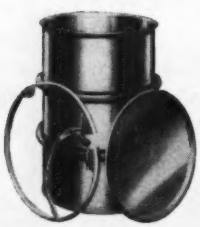

ENDURO Stainless Steel in Niles Barrels and Drums gives you greater protection against product contamination than any other material. It neither affects nor is affected by most chemical and food products. And when you put your product in ENDURO Drums and Barrels, you can expect to save plenty on maintenance costs! ENDURO is tough and strong—it resists rough use and abuse indefinitely—resists corrosion—never has to be painted—is so easy to clean.

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PRODUCTION . . . . .

grams must be varied from batch to batch.

• Leeds & Northrup Co. (Philadelphia) has just released a pamphlet on proportional control which gives a data rundown on its Electromax temperature and conductivity controllers.

• General Electric Co. (Schenectady) is also offering a newly published bulletin on applications for photoelectric recorders with metals, textiles, fatigue and research testing equipment, as an aid in the detection of pipeline corrosion, and in development and machinability testing, medical research, light-intensity study and paper machine-speed measuring.

•

Peaceful Promise: At Oak Ridge National Laboratory (operated for the AEC by Union Carbide & Carbon Corp.), a new type homogeneous reactor produced 150 kw of electricity. Not designed to produce economical electric power, the reactor is, however, capable of producing both fissionable material and electricity. In the recent experiment, scientists brought a pilot model of the reactor system up to a power of 1,000 kw of heat output, then switched the reactor steam to a turbine generator to produce the 150 kw of electricity.

•

Portable Fire-fighters: Walter Kidde & Co. Inc. (New York) is marketing a new line of portable carbon dioxide fire extinguishers, the Fyre-Freez. Available in 2½, 5, 10, 15 and 20 pound models, the units feature squeeze-type valves, are cheaper than Kidde's trigger-operated models.

•

Chemical Coveralls: Filtration Engineers, Inc. (Newark) is introducing a new lightweight Feon coverall. Made of Vinyon-N fabric, the coverall is claimed to be cool, comfortable, acid and alkali resistant.

•

Black Light: Ultra-Violet Products, Inc. (South Pasadena, Calif.) has brought forth a new portable black-light inspection lamp, the Mineralight High-Intensity Model B-50-H. Made of light-weight, spun metal, the lamp is said to be useful in various processing operations for detecting oil leaks, flaws, adulterations and contaminations.

•

Midget Pump: Pioneer Pump Div. of Detroit Harvester Co. (Detroit) is expanding its line of pumps with Model MU. Designed for capacities ranging from 0 to 6 gpm. from free flow to 6 ft. heads, the new centrifugal pump weighs approximately five lbs.

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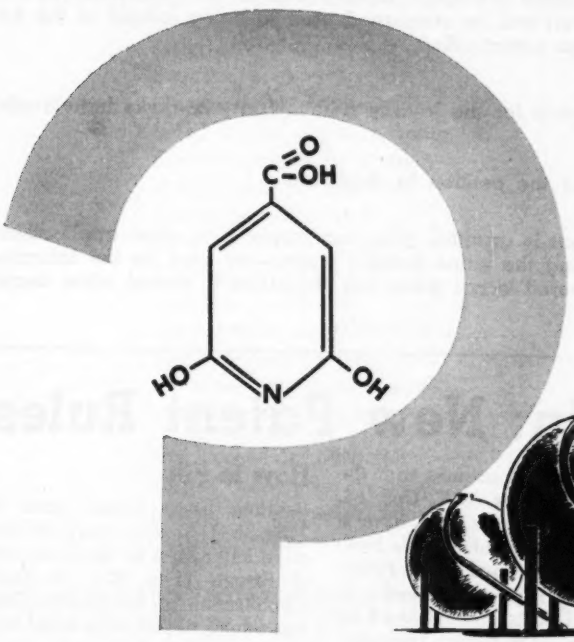

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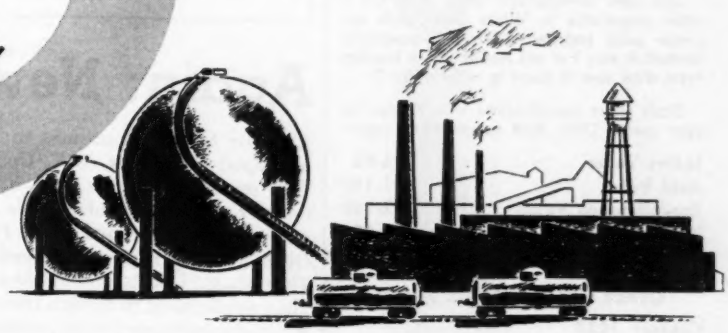

WRITE FOR TECHNICAL DATA SHEETS AND SAMPLES

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Color (Lovibond 5¼")	15Y/3R max.

Other Century Oleic Acids

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Century 1005 Distilled Oleic	Titre 3- 5°C
Century 1010 Distilled Oleic	Titre 8-10°C

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RESEARCH . . . .

If your invention is covered by a secrecy order, you must obtain a permit to file a foreign patent application.

Here's how you petition for a permit under the new patent code revision:

1. **State the reason for the proposed disclosure.**
2. **Enclose a copy of (or an order for) the application unless a copy has already been sent to the agency which initiated the secrecy order.**
3. **Enumerate all countries in which you intend to file.**
4. **Identify attorneys, agents, etc., to whom the secret material will be consigned prior to being lodged in the foreign patent office.**
5. **Vouch for the loyalty and integrity of these individuals.**
6. **File the petition in duplicate.**

If consent is granted, you may apply it to other applications containing the same subject matter—so long as the information covered is not taken out of context to reveal other secret data.

Again: New Patent Rules

Just over their skull sessions with the revamped patent law (CW, Dec. 13, '52), research directors now have a new set of patent regulations to bone up on. Recently released by the Patent Office, the new rules are a revision of Title 37—U.S. Code, give the word on filing applications in foreign countries. If you are concerned with patent protection abroad, you'll have to follow these statutory trail-markers to prosecute your claims. Getting a license to file an application in a foreign country may be your first hurdle.

When to File

If your foreign application is to be filed before or within six months after a corresponding U.S. patent application, you'll need a license from the Commissioner of Patents. A license is not required if you're going to wait longer than six months, or if the invention was not made in the United States.

But when a secrecy order covering your invention exists, an application can only be filed in a foreign country if it is cleared by special procedures (*see box*).

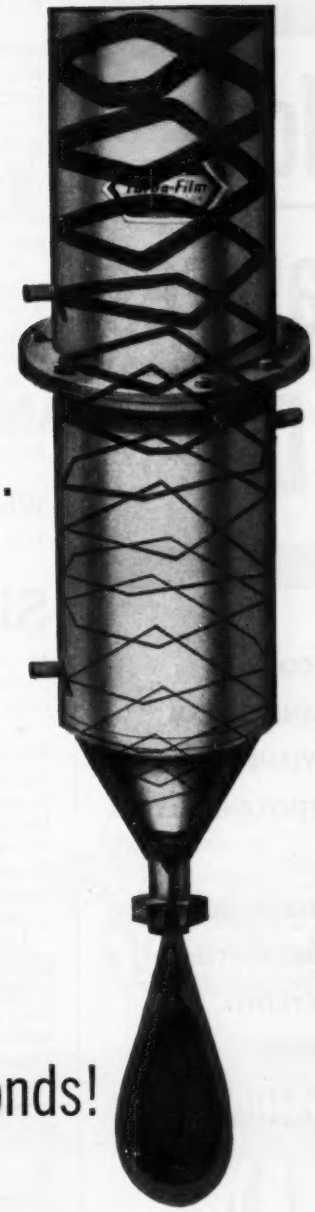
How to File

Petitions for a license come under Title 35—U.S. Code, may be presented in letter form to the Commissioner of Patents (Div. 37). To facilitate identification of the licensed subject, you should submit your letter in duplicate, provide a title and some other description of subject material. The duplicate will be returned with the license, if granted, or notice of action.

In the event that no corresponding U.S. patent application has been made, the petition must be accompanied by a copy of the material upon which a license is desired. If, on the other hand, you have filed a domestic application, the petition must identify this application by serial number, filing date, inventor and title. Word to the wise: where the title is not descriptive and subject matter is clearly of no interest from a security standpoint, inclusion of a short statement of the nature of the invention will save time.

Several pertinent "do's and "don't's" are also likely to keep your petition from getting snarled in red tape:

- Don't refer to two or more U.S.



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CW 3-53

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applications in the same petition, unless they are to be combined in the foreign application; then identify each U.S. application in separate paragraphs.

- Furnish a copy of the application to be filed abroad if it contains matter that is not disclosed in U.S. applications.
- Describe new matter (not contained in U.S. applications) in detail where it is readily identifiable; remainder may be identified by simple reference to pertinent U.S. applications.
- All papers submitted must be in English or accompanied by a certified English translation.

What a License Allows

Your license to file a patent application in a foreign country carries the authority to forward all duplicate and formal papers to that nation, to make amendments and take action in the prosecution of the application.

If no license is required to file an application abroad, no license is needed to prosecute the application. But in such cases, any subsequent paper filed abroad must be separately licensed if it involves disclosure of additional subject matter.

Licenses separately granted in connection with two or more U.S. applications may be exercised by combining or dividing the disclosures, provided additional subject matter is not introduced.

And finally, licenses may be used by anyone interested in filing (in a foreign country) for, or on behalf of, the inventor or his assigns.

Six Over the Hurdle

In breathtaking succession, six new chemical products this week went over their first commercial hurdle.

- Leading the parade was dibromodimethyl hydantoin, a new brominating and oxidizing agent. Just boosted to commercial production, the new brominator could be a real threat to its better established counterparts (e.g. N-bromosuccinimide) and, in some cases, even bromine itself. It's simply a matter of process economics.

Despite the high yields (and simplified procedures) made possible by organic bromine carriers, they are vetoed by high cost in many potential applications. When possible, it often pays to use pure bromine, get along with lower yields. The new carrier promises to upset this balance, capture a piece of the borderline market for bromine and a lot of territory held by other brominating agents.

Produced by Bromine Producers Co., close by the Filer City (Mich.) bromine wells, the new compound now sells for $3.40 or less, in bulk lots (more than 25 pounds) f.o.b. point of manufacture. And future cost cuts are probable. Bromine Producers—a new firm organized by Great Lakes Oil & Chemical Co. (Grand Rapids, Mich.) and Drug Research, Inc. (Adrian, Mich.) — distributes the material through McKesson & Robbins, Inc.

Trade named Brom 55, dibromodi-

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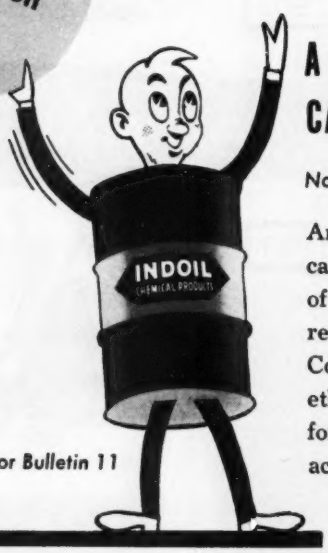

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methyl hydantoin is a crystalline powder containing 55% bromine. Reactions with the material may be closely controlled by selection of media—the compound's solubility in organics varies considerably—and regulation of temperature.

As you might gather from its initial cost, immediate applications are in the production of relatively high-cost items (pharmaceuticals, etc.).

• Of broader potential interest is the newest product of General Aniline & Film's Corp.'s high-pressure acetylene research program. It's 2-butene-1,4-diol, an unsaturated glycol—possibly the only commercial representative of its class.

A highly reactive molecule, butenediol cyclizes to dihydrofuran, hydroxylates to erythritol, and combines with dibasic acids. Promising uses: in the synthesis of pharmaceuticals; alkyd resins; epoxy plasticizers; and as a general intermediate.

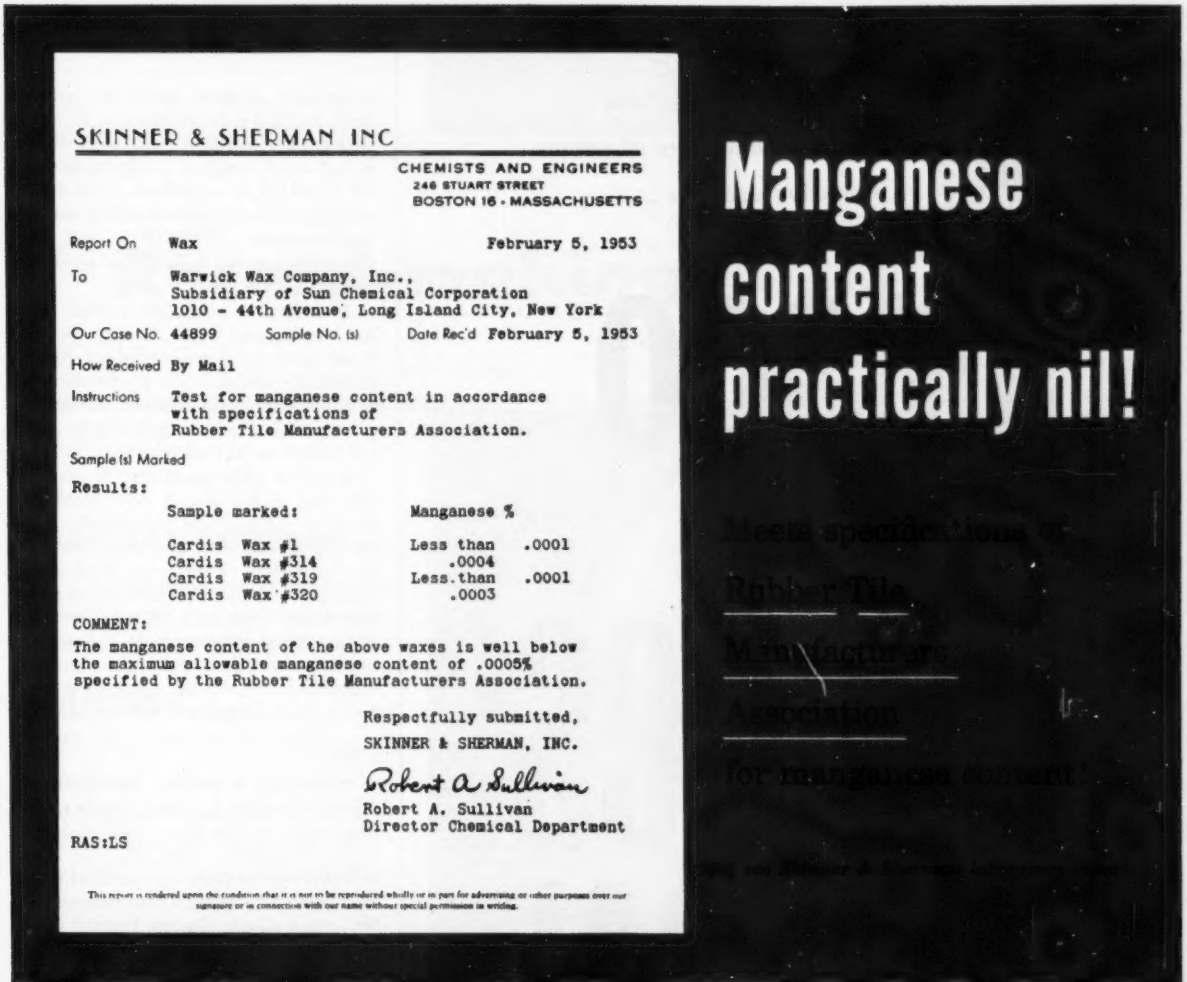
Cost is now pegged at $3 a pound. But this is purely a nominal development price, bears little resemblance to an eventual figure based on large-volume production. The fact of the matter is that butenediol is currently available from substantial preparations-laboratory runs. On a pilot-production basis, cost could plummet to about 60¢ a pound, eventually level off in the neighborhood of 30¢ for large-scale output.

• Also bolstering the ranks of promising intermediates is a new series of high-molecular-weight, unsymmetrical ketones out of Armour and Co. (Chicago). Immediately available in sample quantities are methyl heptadecyl, methyl undecyl, and methyl heptyl ketone. They're in pilot production (capacity: about 100 pounds a month), but—if demand shapes up—output from present facilities could probably be boosted to about 1,000 pounds a month.

Cost, of course, will vary from item to item; but it's estimated that in no case would the commercial price top $2 a pound and it might get down below the $1 mark for some. Indicated uses: plasticizers; soap modifiers; special solvents; oil and grease additives. As chemical intermediates they share a configuration which permits reactions of the carbonyl and terminal methyl group, or both.

Made from fatty acids, the new trio could be the advance guard for a spate of similar ketones now under scrutiny. Possible follow-ups: methyl nonyl; methyl tridecyl; and methyl pentadecyl.

• Emery Industries, Inc.'s soon-to-be-available Emery 901-R is another chemical herald. The code number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CHEMISTS AND ENGINEERS
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Report On Wax
February 5, 1953
To Warwick Wax Company, Inc.,
Subsidiary of Sun Chemical Corporation
1010 - 44th Avenue, Long Island City, New York
Our Case No. 44899
Sample No. (s)
Date Rec'd February 5, 1953
How Received By Mail
Instructions Test for manganese content in accordance with specifications of Rubber Tile Manufacturers Association.
Sample (s) Marked
Results:
Sample marked:
Manganese %
Cardis Wax #1
Less than .0001
Cardis Wax #314
.0004
Cardis Wax #319
Less.than .0001
Cardis Wax #320
.0003
COMMENT:
The manganese content of the above waxes is well below the maximum allowable manganese content of .0005% specified by the Rubber Tile Manufacturers Association.
Respectfully submitted,
SKINNER & SHERMAN, INC.
Robert A. Sullivan
Robert A. Sullivan
Director Chemical Department
RAS:LS
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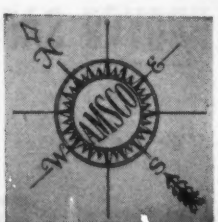

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Complete technical data, prices and samples available on request

designates a new grade of azelaic acid, the first pilot-product of Emery's new ozone oxidation process. A white, flaked solid, melting at approximately 96 C, 901-R is a mixture of saturated aliphatic dibasic acids in which azelaic predominates (80%-90%) and the C_{11} acid is present in minor amounts (about 10%).

Monohydric esters of azelaic acid have relatively high boiling points, make good vinyl and cellulosic plasticizers, are useful in the preparation of synthetic oils and greases. Esters of glycerine and other polyhydric alcohols serve as soft alkyd resins.

Azelaic's pilot-plant stay is rapidly drawing to a close. A new plant, to produce azelaic and pelargonic acids by ozone oxidation of oleic, is due in by the middle of this year. Both compounds will be available in sizable quantities. And, says Emery, "because of increased efficiency of the ozone oxidation process over the current chromic acid method, substantial savings in processing costs will be possible . . . lower selling prices on azelaic acid."

• Aerosil, a white, fine-particled silica is Godfrey L. Cabot, Inc.'s (Boston) entry in the new product derby (*CW Newsletter, Dec. 6, '52*). Developed by the German chemical firm, Degussa (Frankfurt), the material is 99%-pure silicon dioxide formed by a high-temperature, gaseous reaction. According to Cabot, "the collection of Aerosil particles from the gaseous phase results in a product of extremely low bulk density . . ." Ease of dispersion is the net result.

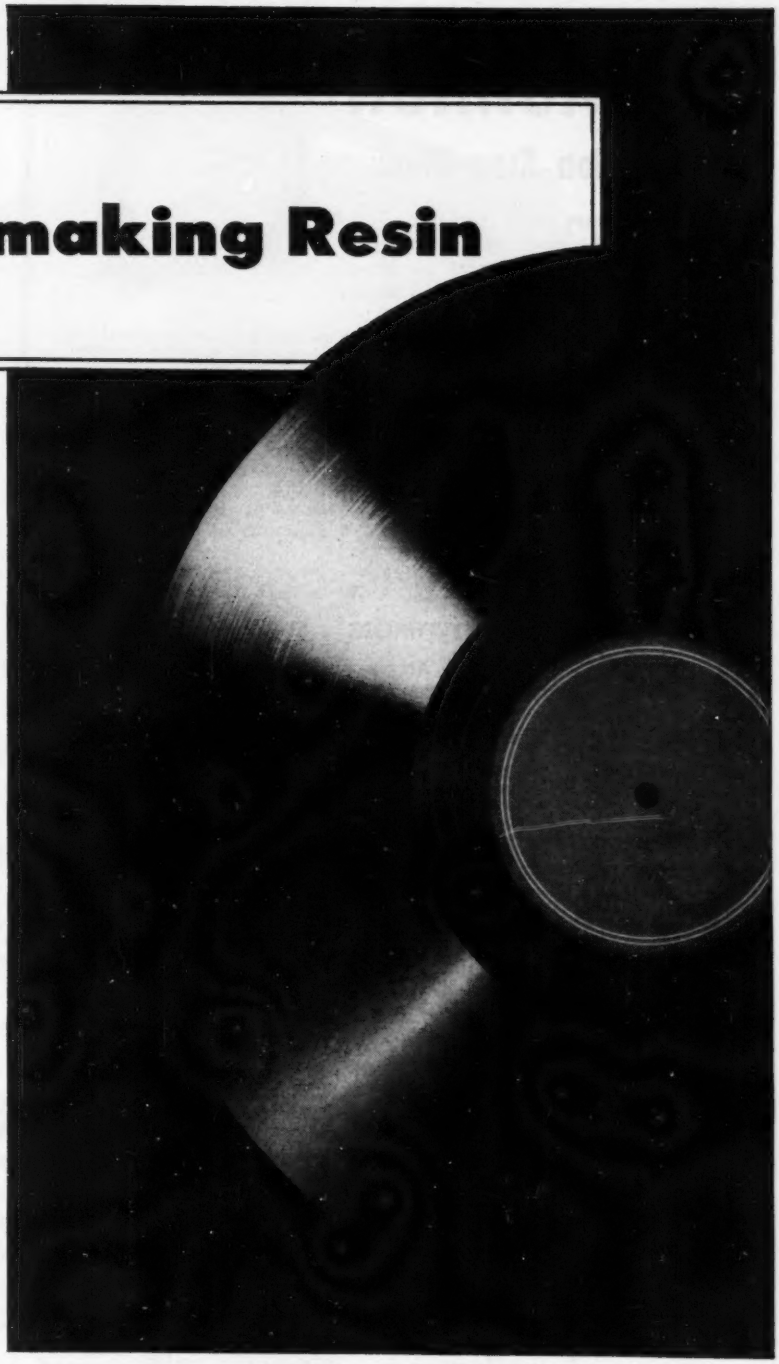
Potential outlets for the new silica: in the rubber industry as a "white carbon black" for the manufacture of strong white and colored rubber products; in lubricants, plastics, paints, cosmetics and printing inks as a gelling and thickening agent, emulsion and pigment stabilizer, and flatting agent; as an anti-caking agent; and in miscellaneous applications in the insecticide, adhesive, wax and electrical industries.

The Boston firm has negotiated a research and patent licensing agreement with Degussa, will build a plant when warranted by domestic demand. In the meantime, Cabot will import for sale in this country.

• Rounding out the sextet is Chas. Pfizer & Co.'s Glucatase, an enzyme product for the preservation of dried eggs. The new material, a combination of the enzymes glucose oxidase and catalase (*CW, Mar. 15, '52*), does its beneficial work by decomposing glucose into innocuous substances.

Here's how: Used before the drying

Record-making Resin



CHEMICAL PROBLEM...

. . . to find a low-cost, easy-to-get material for making phonograph records and other plastic products.

SOLUTION...

. . . Vinsol® Resin, one of many materials produced by Hercules in large quantities from the Southern pine. Low in cost, and easily mixed with other ingredients, Vinsol aids in the production of two types of records. In the standard 78 r.p.m., it replaces a substantial amount of imported shellac. Combined with ethyl cellulose or vinyl compounds, it offers many advantages in break-resistant phonograph records.

RESULT...

. . . long-lasting phonograph records that can be priced to meet popular demands. In other uses for plastics, Vinsol serves as a thermoplastic binder and extender in phenolic resin compositions.

Hercules' business is solving problems by chemistry for industry . . .

. . . textiles, paper, rubber, insecticides, adhesives, soaps, detergents, plastics, paint, varnish, lacquer, to name a few, use Hercules® synthetic resins, cellulose products, chemical cotton, terpene chemicals, rosin and rosin derivatives, chlorinated products and other chemical processing materials. Hercules® explosives serve mining, quarrying, construction, seismograph projects everywhere.

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G53-2

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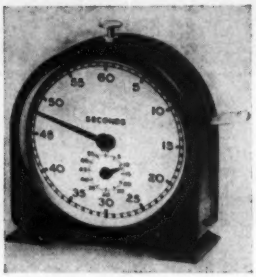
Precision Stop-Clock

for Laboratory and Industrial Timing—the accuracy of a fine stopwatch—but easier to read and built to take hard knocks.



Durachron is a precise spring-wound stopclock with the same action as a stopwatch. It frees both hands for whatever manipulation must be done during the timing operation.

USEFUL wherever timing observations to a split-second are required.

EASY TO READ Legible 4 inch dial, visible across room. Glass front keeps dial clear.

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process, glucose oxidase transforms the glucose in yolks and whites into gluconic acid and hydrogen peroxide. Catalase then breaks the hydrogen peroxide down to water and oxygen.

Deterioration of dried egg whites (which contain most of the egg glucose) comes about by the interaction of glucose with egg protein. The whites turn brown, develop off-flavors and odors, lose their solubility and whipping properties. By nipping this process in the bud, Pfizer claims its brainchild makes possible the incorporation of dried eggs in food products which now require fresh or frozen eggs.

Glucatase is a glucose oxidase-catalase enzyme system in a 32% glucose solution. A clear amber liquid, it's miscible with water, will be sold in one- and five-gallon cans. One pound of the product desugars 1,000 pounds of egg whites in eight hours.

Aid from Washington

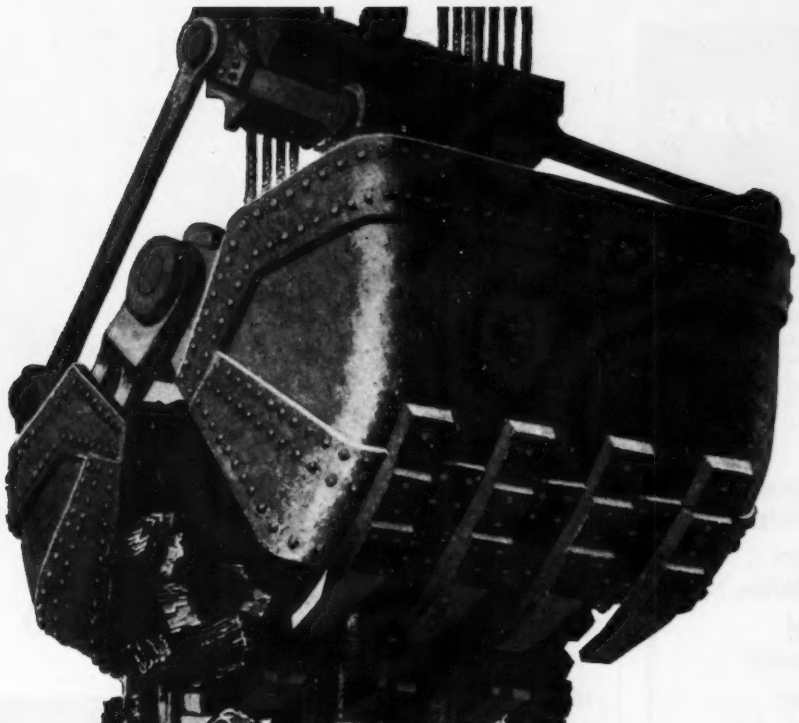
In the government's eye, research laboratories rank with manufacturing plants in the long-term defense picture. Under a new defense expansion program, a company building a laboratory in connection with a government research and development contract is eligible for rapid tax amortization on its new facilities.

To qualify, a laboratory must be completed by Jan. 1, 1956, be approved by the sponsoring government agency as necessary to fulfill defense contracts. Facilities for routine or control testing are ineligible, but might be covered under industry goals.

There won't be a paucity of potential candidates for the rapid write-offs. During 1953 the federal government will spend a little over $2 billion on research, most of it in the interest of national defense. More than half of this sum will finance work in private laboratories; the balance is earmarked for universities and government labs.

Office of Defense Mobilization makes no public estimate of the number of possible applicants, says it will grant all applications properly endorsed by the sponsoring agency.

• Also from Washington comes word of a survey (by National Research Council) showing that the nation's graduate schools could take on nearly 8,000 additional doctoral students and more than 11,000 candidates for the degree of M. S. The study also points out that the large college graduating classes of 1949 and 1950 will result in a peak of new doctorates in 1953, a probable decline beginning the next year.



Here comes

- 10 PAIRS OF NYLONS
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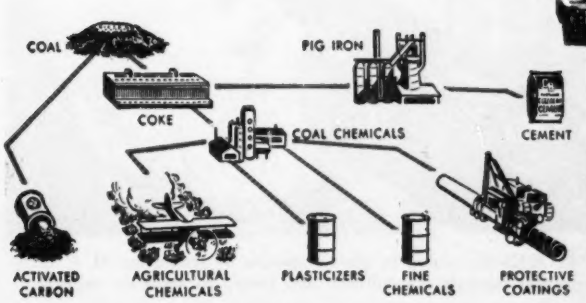
- 1 GALLON OF DDT
- 10 VITAMIN CAPSULES
- 2 SHOWER CURTAINS
- 25 LBS. OF FERTILIZER

EVERY TIME this big unloading bucket bites into a bargeload of coal, we're starting another chemical miracle on its way to you. Your new synthetic fiber suit, the drug that "knocked" your flu so fast and the bright enamel on your new car could all have been born in the coal chemical recovery mains of our coke ovens.

But *this* may be the real miracle: From our coking operations we produce not only coke and coal chemicals, but we follow through with basic products like pig iron and cement on one hand and finished chemical products like Pittsburgh Insecticides and Dyestuffs on the other—all in *one continuous, interlocking operation.* This highly developed integration—and it now embraces ten operating divisions—requires considerable engineering skill and years to perfect. But the payoff is the unusual production efficiency and product quality control that have become synonymous with Pittsburgh Coke & Chemical.

W&D 4841



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Zirconium Basic Carbonate Cake
Zirconyl Nitrate
Sodium Zirconyl Sulphate
Zirconium Oxychloride, Reagent
Zirconium Silicate
Saltcake
Potassium Carbonate
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HAWTHORNDALE COUNCIL: To ICI's experimental labs has come a new chemical. Chiefs of the departments talk it over with C. C. Tanner

Sizing Up Ag Chems

How good is a new agricultural chemical? Is it better, or cheaper than an existing product? Is it safe to use? Does it affect plant flavor?

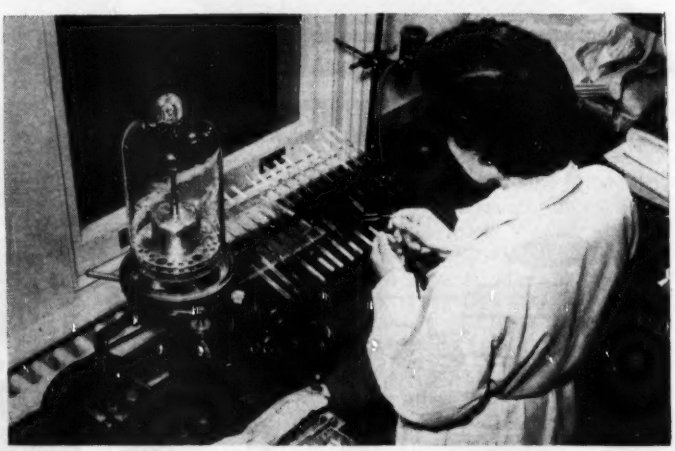
To check these and other important phases of farm chemical use, Imperial Chemical Industries established a testing station, Hawthorndale Research Laboratories, in Berkshire, England.

This week CHEMICAL WEEK's camera visited Hawthorndale, recorded some of the many phases of testing that agricultural chemicals are subjected to.

BHC or Better: One of the prize results of the Hawthorndale work has been the widely used insecticide, benzene hexachloride (BHC), worked out by F. J. D. Thomas.

But the team at Hawthorndale isn't

TEST INSECTS, in this case locusts, are bred in room maintained at humid 30 C.



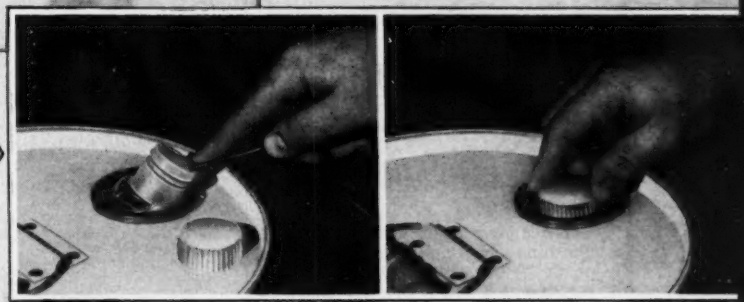
FUNGAL SPORES are sealed in glass ampoules by technician M. E. Kennedy. Spores and bacteria are cultured and frozen to maintain strength.

Two Reasons FLEXSPOUT® Means More SALES of any Product Sold in Steel Pails

1

FLEXSPOUT Makes Pouring, Re-Sealing and Storing Your Products Easier Than Ever Before:

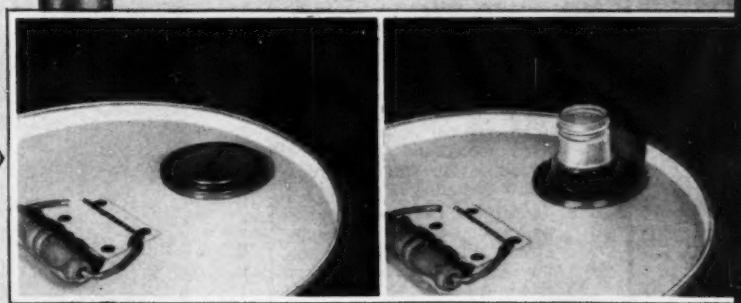
FLEXSPOUT can be opened with any pointed tool. The flexible spout eliminates muss and fuss in pouring and mixing. Re-sealing is simple and foolproof with the plastic screw-top. The spout retracts below the pail cover for easy stacking during storage.



2

FLEXSPOUT Delivers Your Product In Better Condition:

It's the first really leak-proof pail closure ever developed. It seals directly on the pail metal . . . is actually stronger than the pail itself. Since only the chemical-resistant, non-toxic plastic touches the liquid, there's no chance for contamination.



SEE FOR YOURSELF!

Because words and pictures can hardly begin to describe this amazing new closure, we'll gladly send you a free sample for your inspection. Send for it today!

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ONE CONTROL DOES THE JOB OF TWO

Mercoid DA-400 Series Pressure Controls incorporate a single bourdon tube which actuates two independently adjustable Mercoid magnet operated mercury switches to accomplish various circuit operations. For example:

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2. As an electrical interlock to open one circuit as pressure rises above and the second circuit as the pressure drops below operating range.
3. To provide two-stage control by opening or closing one circuit on a rise in pressure and the second circuit on a further rise in pressure.

Ranges 0-30" to 300-2500 psi

Write for Bulletin 5P

THE MERCOID CORPORATION
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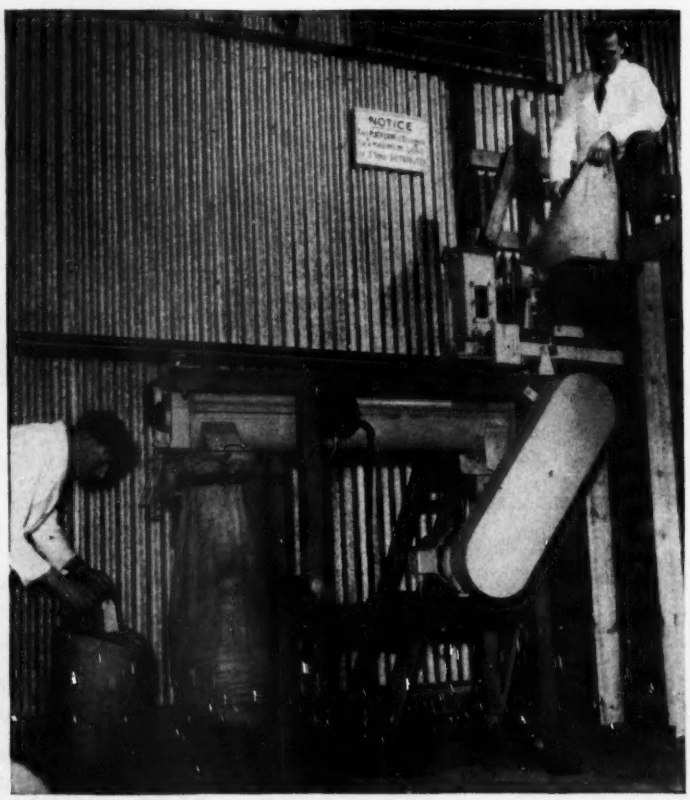
SEEDS TREATED with a new seed dressing are counted out, and planted with untreated controls in moist sand to check value of new fungicide.

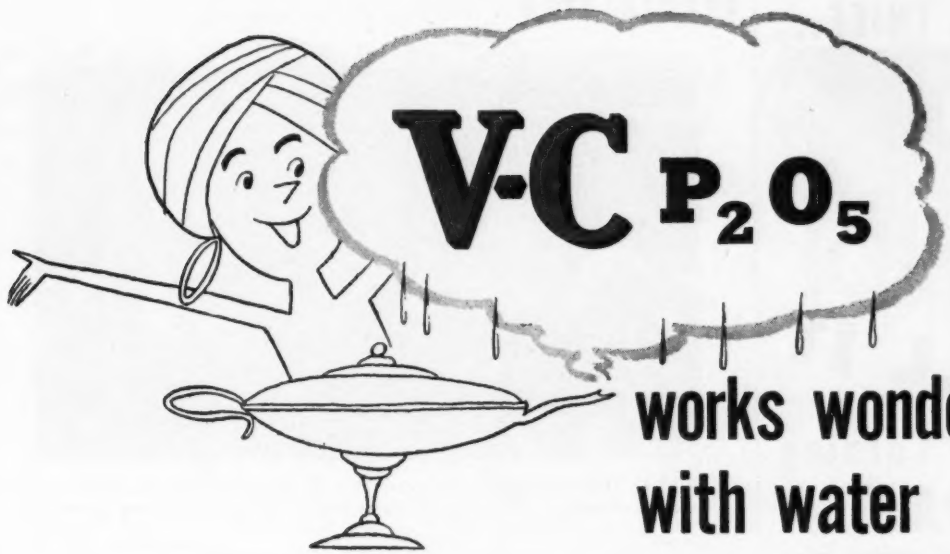
Story begins on pg. 52

From British Test Plots . . .

Continued on pg. 56



FARM SCALE tests of the seed dressing are also run: seeds are mechanically coated as shown. Agrosan G N was Hawthorndale product.



works wonders with water

Whether you are manufacturing cleansers or water softeners, processing textiles or cheese, dispersing clay or treating boiler water, it will pay you to investigate the advantages of V-C Sodium Phosphates. Their water-softening ability, emulsification and dispersion properties and free-rinsing quality over a wide range of uses are outstanding. Examine the individual characteristics of each V-C Sodium Phosphate, outlined below, then write for full details.

V-C DSP (Disodium Phosphate) Anhydrous

Specifications: Minimum P_2O_5 content is 48.0%; less than 2% moisture. The pH of a 1% DSP solution is 9.0.

Physical Properties: Small white flakes, readily soluble giving a clear solution.

Characteristics: Mild alkalinity, emulsifies fats and oils, "deflocculates" or suspends solids, is a good buffer.

Advantages: Anhydrous DSP contains no water of crystallization as does the duohydrate DSP or crystalline (12 H_2O) DSP. Very economical, less alkaline than TSP, excellent water softener.

Uses: Boiler water treatment to control caustic embrittlement, textile cleaning, manual cleansers, plasticizer in the manufacture of processed cheese, and many other uses.

V-C TSP (Trisodium Phosphate)

Specifications: Surpasses requirements of Federal Specification O-T-671a and ASTM Specification D538-44. P_2O_5 content is 18.5%. The pH of a 1% TSP solution is 11.8.

Physical Properties: Easily soluble white crystals.

Characteristics: Readily emulsifies fats and oils, softens water, "deflocculates" or suspends solids, rinses clear.

Advantages: Has higher alkalinity than DSP or polyphosphates. Good water softener. Economical.

Uses: For manufacture of cleansers, cleaning compounds, soaps and water softeners. Also for metal cleaning, boiler water treatment, textile processing, and other uses.

V-C STPP (Sodium Tripolyphosphate) Anhydrous

Specifications: Minimum P_2O_5 content is 57%; less than 1% moisture; calcium value, 10. The pH of a 1% STPP solution is 9.8.

Physical Properties: Anhydrous white powder (finer than 20-mesh), soluble in water.

Characteristics: Mild alkalinity, good sequestering agent, very effective peptizing agent, fairly stable.

Advantages: Greater sequestering power than TSPP. Cheaper than organic sequestrants. More stable than other polyphosphates except TSPP.

Uses: Builder for synthetic detergents and soaps, boiler feedwater treatment, industrial cleansers, textile processing, paper manufacturing, clay dispersing and many other uses.

V-C TSPP (Tetrasodium Pyrophosphate) Anhydrous

Specifications: Minimum P_2O_5 content is 53%; less than 1% moisture; 98.0% $Na_4P_2O_7$. The pH of a 1% solution is 10.2.

Physical Properties: Anhydrous white powder (finer than 20-mesh), soluble in water.

Characteristics: Exceptional water softening ability, high emulsification and dispersion properties, mild alkalinity, good buffering and rinsing properties, very stable.

Advantages: More stable than other polyphosphates. More economical than organic sequestrants and other polyphosphates.

Uses: Builder for synthetic detergents and soaps, mud treatment, water treatment, textile processing, industrial cleansers, cheese manufacture, cold water paints and other uses.

Elemental Phosphorus
Phosphoric Acids
Trisodium Phosphate
Disodium Phosphate-Anhydrous
Tetrasodium Pyrophosphate
Sodium Tripolyphosphate
Ferrophosphorus
Sodium Metasilicate
Tetraethyl Pyrophosphate
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The most versatile and efficient of defoamers, Dow Corning Antifoam A is effective at concentrations in the range of:

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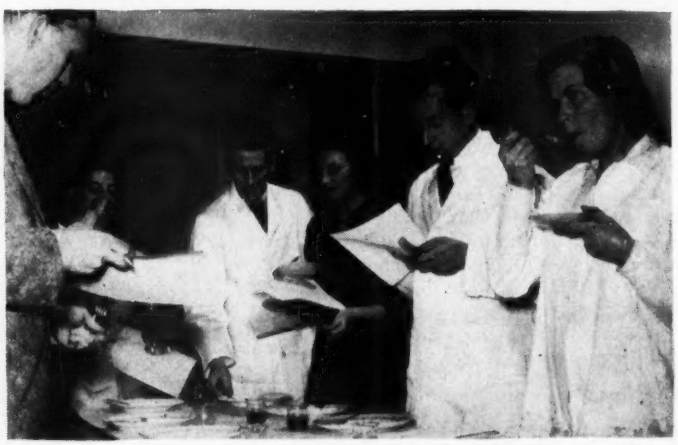
FIELD TRIALS measure the value of a chemical designed specifically to combat wheat bunt. Here the Mycology section checks actual wheat growth.



FLAVOR PANEL examines another angle to farm chemical use—do the new products affect the flavor of plants grown with them? Taste will tell.

Story begins on pg. 52

To World Wide Farms

resting on its laurels. With C. C. Tanner, research manager, chiefs of the various sections (F. J. D. Thomas; McNaughton, literature research; Sharp, chemicals; Tipler, mycology) thoroughly examine the products that parent ICI turns out in its plants.

Standard Bugs: In addition to running field trials, the Hawthorndale Research Labs maintains and breeds its own insects, fungi and bacteria. Aim is to provide pests of known, standard resistance to chemical agents, so that new compounds can be accurately compared for potency.

Not content that a chemical be simply powerful, researchers at the ICI test station also check on the flavor-affecting qualities of the various ag chemicals.

In these assays, as Dr. Thomas puts it, "it's easier to detect tainted food by the palate than by laboratory analysis." In gauging the flavor of potatoes, for example, sips of apple juice are used to freshen the taste buds.

Since its establishment in 1936, Hawthorndale Labs has produced a number of farm winners, in addition to BHC.

The new ones include the fungicides, Peredox and thiram, as well as the seed dip, Agrosan G N. But with world population growing steadily, and the demand for food on the increase, there's an increasing need for chemicals to boost farm production. Despite the advances in agriculture made possible by already discovered compounds, insects and fungus haven't been licked yet—there's plenty of work left for the Hawthorndale researchers.

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Famous FLIT now s-p-r-a-y-s automatically from Crown SPRA-TAINER to kill many household insects the modern and convenient way. When you press the valve, small particles of deadly insect-killing ingredients are forced into the air. These small particles of insecticide float for some time and kill many insects on contact.

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Write for this sixteen page book which describes Harshaw's major activities.

SPECIALTIES . . . . .

Calgon Gains. Calgon, Inc. (Pittsburgh, subsidiary Hagan Corp.) will introduce shortly two new home-use products, Calgon Bouquet, a scented bath powder, and Thanx, a new compound for use in home dishwashers, as well as an aid to soaps in clothes washing.

The company has reported that 1952 was a record year in its history, and that January of this year shows a continued high demand. Since 1947, Calgon sales have grown from about 8% of the parent company's sales, to more than 19% in 1952.

•

Tank Cleaner: L. M. Gould Co.'s (San Francisco) Sta-Clean Toiletabs are being pushed now in major cities coast to coast. The tablets, two for 29¢, eight for $1, are said to inhibit odorous bacteria growth, stop iron stains when dropped into toilet flush tanks, are nontoxic.

•

More Corn: At a cost of about $2.25/acre, yields of corn can be increased from 10 to 40 bu./acre by use of 2,4-D and its amine salts. That's what R. L. Lovvorn, head of weed control research in the U.S. Dept. of Agriculture, says.

Much of the change in yield depends on the hybrid seed used, as well as the maintenance of sound cultural practices. The USDA recommends the 2,4-D as a pre-emergence spray, post-emergence spray, and lay-by spray (time of last cultivation), to to cut the number of cultivations and boost yields.

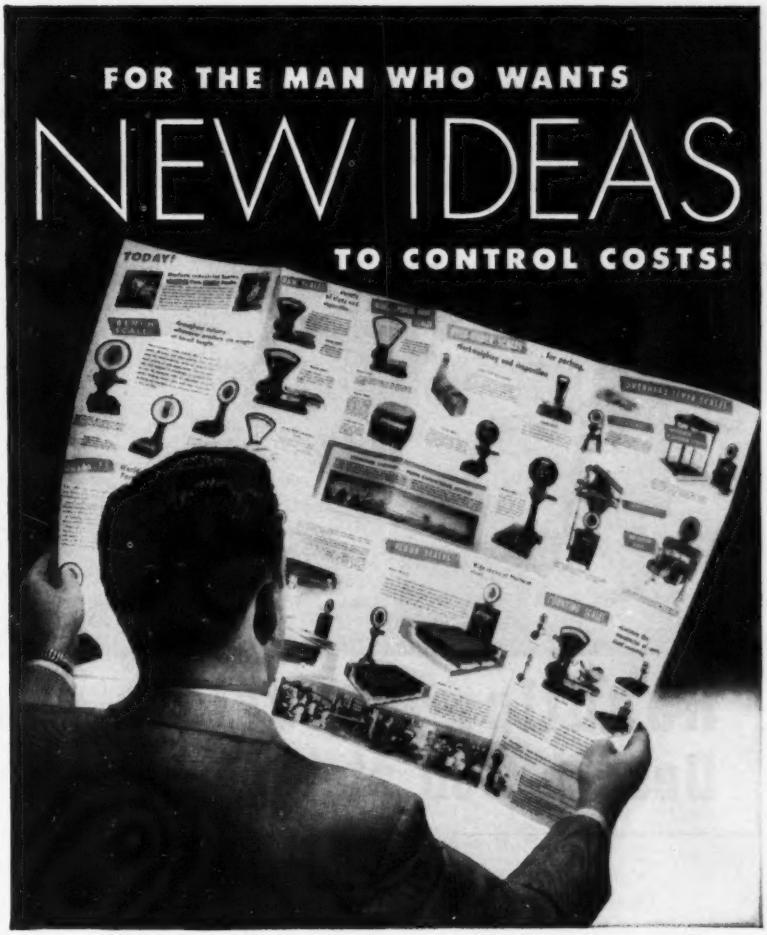
•

Industrial Adhesive: A new epoxide resin adhesive for bonding nonporous surfaces has been developed by the Borden Co.'s Chemical Div. Tagged Epiphen XR-823, the new material is recommended for bonding ceramics, rubber and glass; is said to be water-, acid- and solvent-resistant when cured. Test kits of the new glue, with catalyst and filler, are offered by Borden at $1.50, so that manufacturers can test the minimum shrinkage, high strength and heat resistance of the new adhesive.

•

Add Emulsifier: Fine Organics, Inc. (New York) is now making an emulsifier for preparation of toilet bowl cleaners. Ortho Acid Emulsifier permits manufacture of stable hydrochloric acid emulsions containing up to 23% HCl.

Fine Organics has also appointed Standard Products, Inc., Wichita, Kan., as exclusive selling agent for its aviation-industrial line, in Kansas, Oklahoma and Missouri.



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Whatever your problems in weighing, checking, testing, counting, batching, force-measuring and other chemical weighing operations . . . there's a modern Toledo to do the job with high *accuracy, speed* and *dependability*. Have you checked your scale needs? Get latest information in this widely used reference on Toledos that help you guard costs . . . speed production. Look into the advantages of Printweigh in stopping losses that originate through human errors. Send coupon for new edition—"Toledo, Headquarters for Scales."

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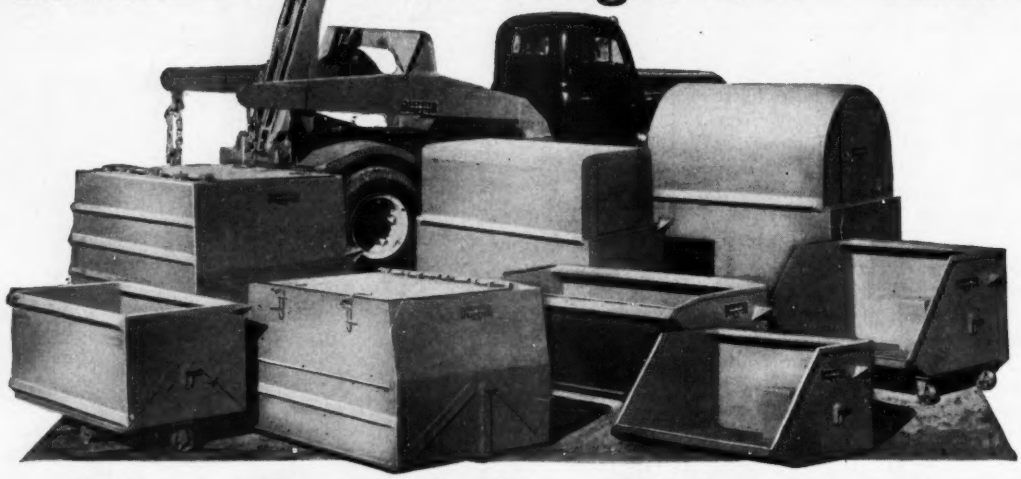
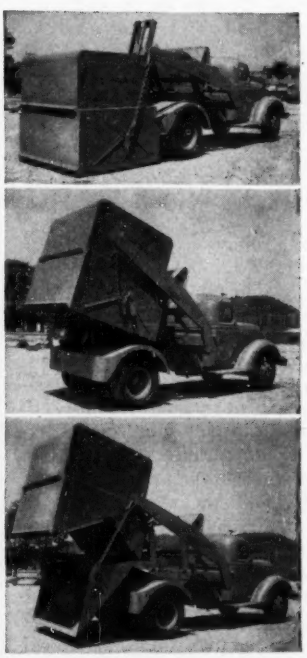


Handling Materials of Almost Every Description at the Lowest Possible Cost!

One Dempster-Dumpster mounted on one of your trucks serves any required number of big detachable Dempster-Dumpster Containers spotted at convenient materials accumulation points inside and outside your buildings. The capacity of these containers range up to four times greater than the average dump truck body. They are built in a wide variety of designs best suited to the materials handled—be they solid, liquid or dust . . . trash or rubbish . . . bulky light or heavy. The truck-mounted Dempster-Dumpster, with only one man, the driver, picks up one pre-loaded container after another, hauls it to destination where materials are dumped or load set down intact. The Dempster-Dumpster may handle raw materials on one haul, liquids on another, trash and rubbish on another, etc. It's like having one truck with 15, 25, 65 or 100 different bodies.

This is the *Dempster-Dumpster System*—the modern method of bulk materials handling. It is saving thousands of dollars annually for hundreds of plants in every type of industry because it: Eliminates 3 to 5 conventional trucks and crews—reducing cost of truck equipment and operation accordingly. . . Eliminates standing idle time of trucks and crews. . . Eliminates re-handling of materials. . . Increases efficiency, sanitation and good housekeeping.

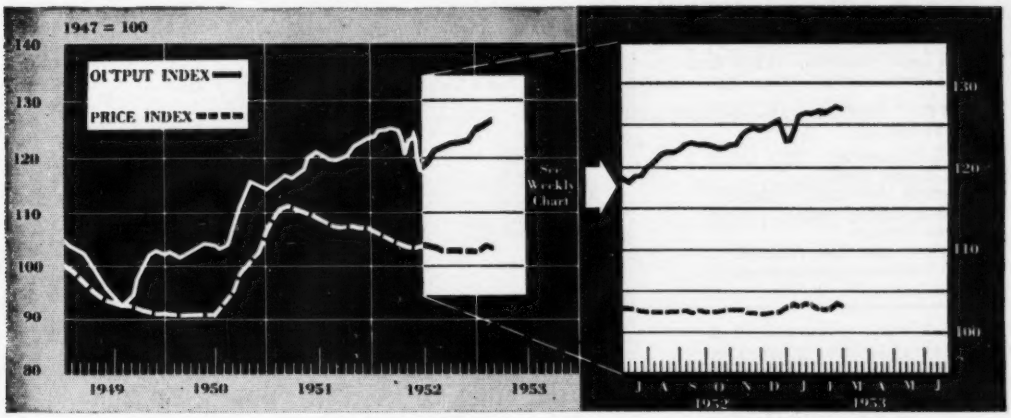
The *Dempster-Dumpster System* is, without question, the most efficient method of materials handling by truck ever devised! More efficient and lower cost materials handling in your plant may be simply a matter of getting the minds of your engineers and ours together. Write us now. The *Dempster-Dumpster System* is manufactured exclusively by Dempster Brothers, Inc.



WHEN A CONTAINER is full, the Dempster-Dumpster picks it up, hauls it to destination and dumps the materials or sets the load down intact. These three simple operations, shown above, are hydraulically controlled by driver in truck cab.

DEMPSTER BROTHERS, 2112 Dempster Bldg., Knoxville 17, Tenn.

MARKETS . . . . . .



CW Index of Chemical Output—Basis: Total Man Hours Worked in Selected Chemical Industries
CW Price Index—Basis: Weekly Prices of Sixteen Selected Chemicals

MARKET LETTER

Price boosts in basic chemicals were big news last week. Solvay's mark-ups of 15¢/100 lbs. for soda ash and 20¢/100 lbs. for chlorine were quickly seconded by Diamond Alkali.

Because price ceilings were still in effect and might have continued until April 30, the new prices, said company officials, would not apply until May 1.

But the day following Diamond's announcement, ceilings were off. Joseph Freehill, Director of Price Stabilization, signed General Overriding Regulation 44, thereby lifted price controls from all chemicals—with one conspicuous exception: sulfur. Also included: sulfuric acid, oleum, sulfur trioxide.

Plans for a sulfur price boost are already shaping. Although amounts and effective dates of increases vary, domestic shipments will probably take a first hop of $2 to $3/ton to $25/ton level.

Elsewhere, sulfur made news. Following the freeing of the item from international allocation, New Zealand is dickering with four major U.S. suppliers for 125,000 tons this year, a like amount for 1954.

In Wellington, Minister of Agriculture Holyoake explained that although New Zealand's annual sulfur requirement is only 96,000 tons, she was trying to take advantage of the current improved supply picture.

Supply problems plagued U.S. Department of Agriculture, too; it is trying to lift some of the huge tallow surplus from the overburdened meat packing industry's shoulders. G. E. Hilbert, bureau chief of the Eastern Regional Research Laboratory, avers that fats and oils, after relatively simple processing, can be used to make novel and cheap plasticizers.

Three companies, says USDA—and it won't name them—are getting set to exploit the development.

An old actor reappeared on the zinc market stage last week. In a surprise move (following a year's inactivity) General Services Administration, national stockpiling agency, asked leading suppliers for bids to furnish the metal. Coming at a time when prices are depressed to the "distress" level, the government request was greeted with mixed feelings.

WEEKLY BUSINESS INDICATORS	Latest Week	Preceding Week	Year Ago
CHEMICAL WEEK Output Index (1947=100)	126.3	126.5	125.1
CHEMICAL WEEK Wholesale Price Index (1947=100)	103.6	103.4	103.3
Bituminous Coal Production (daily average, 1,000 tons)	1,350.0	1,417.0	1,647.0
Steel Ingot Production (1,000 tons)	2,256.0	2,284.0	2,098.0
Stock Price Index of 14 Chemical Companies (Standard & Poor's Corp.)	258.0	254.0	235.7

MONTHLY INDICATORS—EMPLOYMENT (Thousands)	Latest Month	Preceding Month	Year Ago
All Manufacturing	13,418	13,527	12,766
Non-durable Goods	5,613	5,711	5,502
Chemicals and Allied Products	534	534	536
Paper and Allied Products	421	425	405
Rubber Products	232	230	218
Petroleum and Coal Products	197	201	193

Price decontrol shouldn't affect farm supplies. National Agricultural Chemicals Association's Lea Hitchner told *CW*, "Insecticides, fungicides, weed killers and similar agricultural chemicals are in adequate supply . . . and prices well below ceilings in all cases."

Good news for benzene and short-supplied tulene users comes from Shell Oil Co. Its new Houston refinery, just put on-stream, will add 19 million gals. of benzene (about 10% of domestic output), 33 million gals. of toluene yearly.

Phthalic anhydride market, now firm, might grow tighter. Some producers, currently behind in shipments, say that if demand for alkyd resin car finishes continues upward, supplies of ththalic anhydride will be harder to come by.

But naphthalene producers predict no tightening of their present soft market. Despite increased demand from phthalic anhydride makers, naphthalene, now over-plentiful, will continue so; and there's a chance that any slackening from present demand could lead to a lower price tag.

Canada's fast-expanding plastics industry could chalk up 20% more business this year than 1952. That's the industry leaders' consensus. Furthermore, "Even conservative forecasters estimate a tripling in sales volume by 1960," Frank Schoenfeld, B. F. Goodrich vice-president, told assembled members of the society of the Plastics Industry, meeting in Niagara Falls last week for the 11th Canadian Conference.

Add an antibiotic and double the yield; that's the new pattern of farming. And it could mean vast new outlets for antibiotics producers. U.S. Industrial Chemical's H. J. Prebluda predicts that by stimulating growth and killing plant diseases, antibiotics might solve most of the world's hunger problems.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending March 16, 1953

UP

	Change	New Price		Change	New Price
Copper chloride, anhy., f.o.b., wks.	$ .065	$ .41	Coconut oil, crude, tanks NY	$ .0225	$ .21
Copper chloride, crys., f.o.b., wks.	.0475	.275	Cottonseed oil, crude, tanks, Texas	.005	.1475

DOWN

	Change	New Price		Change	New Price
Cresylic acid, imp., ADF, gal.	$ .10	$ .75	Carnauba wax, yellow, No. 1, bags, ton lots	$ .01	$1.29
Phenylethyl acetate, bots.	.10	1.55	Zinc dust, pigments, bbls., c.l., wks.	.025	.1525

All prices per pound unless quantity is stated.

ESSO SOLVENTS are being used in more and more industries where processing requires *versatility* plus dependability. A great many different industries such as paint — textiles—chemicals—food packaging — leather — many others are using versatile Esso Solvents.

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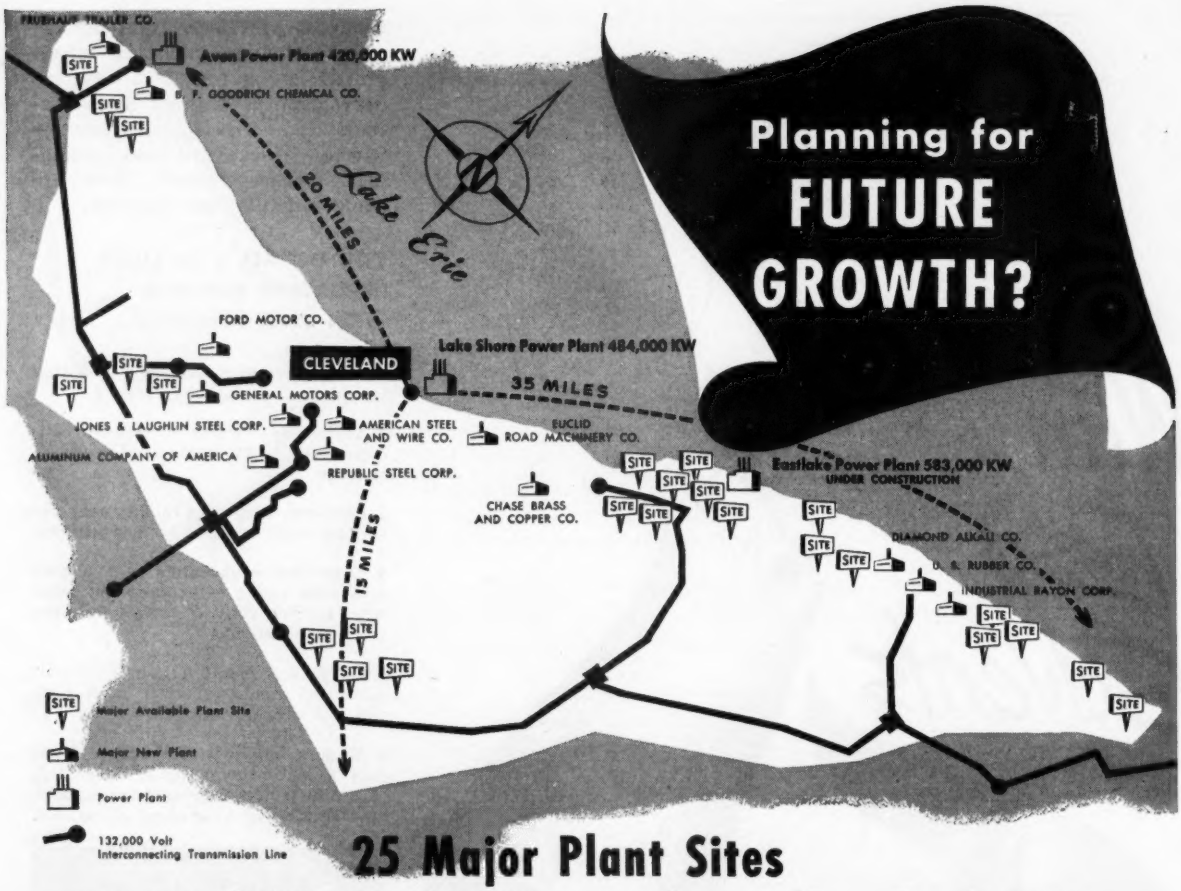
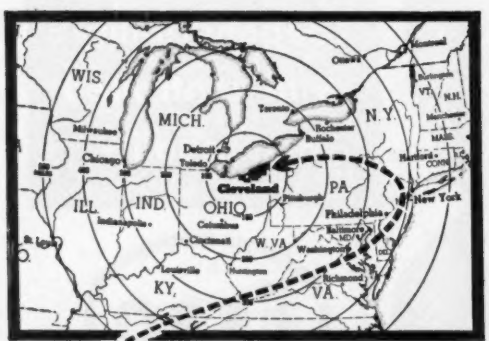
Memphis, Tenn.—New Orleans, La.



25 Major Plant Sites now available in the Metropolitan Cleveland Area



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From Planning To Plant Site To Completed Plant, you are invited to use our free Location Engineering Service for information and assistance in building for the future in the Cleveland-Northeast Ohio area.

For up-to-the-minute facts about any of the plant sites shown above, phone or write Development Department, Richard L. DeChant, Manager.

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Everything Under Decontrol

With price and inventory ceilings coming off, sales managers and purchasing agents foresee only a few mark-ups.

Low inventories, greater sales efforts and few tight commodities are present features.

Outlook: generally fair to brisk sales for next few months; cloudy and unsettled later.

Last week a new price trend seemed to be developing. Significant or not—several basic chemicals, including soda ash, chlorine, ethyl alcohol and benzol chalked up increases. Rumors of additional mark-ups floated about the industrial chemical market.

To size up the climate in these days of decontrol and decision, CW queried chemical sales managers and purchasing agents throughout the country, obtained this composite picture of economic conditions and prognostications in the chemical process industries.

Although replies varied over the geographic map these general opinion trends emerged:

- A few selective upward adjustments are considered inevitable. In most cases the bumps were considered justified, based upon long-deferred action in the face of increased costs.
- Competition and the old law of supply and demand, not the lifting of price and/or inventory control, will govern market action of most items.
- With inventories at a healthy low but most chemicals in ample supply, sales activity is expected to be brisk.
- Faith in the policies of the new administration and a desire to establish a reputation for industrial statemanship are reflected in hold-the-line predictions.

Down East: Although opinions tallied closely throughout the country, strength of conviction as to what the future might bring varied with the area. Proceeding westward, a tenor of increasing confidence characterized the comments.

- In Pittsburgh, for instance, the sales manager of a large producer echoed the general sentiment of the area in saying, "I don't know as there will be much of a price increase."

Another official rationalized, "There is no reason to look for a price decrease because the future outlook now is good."

- Farther north, in Boston, a sales manager yielded the noncommittal response, "Nobody seems to be expecting product scarcity or price hikes."
- Over in Buffalo the attitude lightened to a more complacent "let's wait and see what happens to us, first." Chemical suppliers in that area are watching for action from basic commodity manufacturers to tip them off as to which direction, if any, the wind is to blow.

Representative reply, in this case from the sales vice-president of a medium size corporation was, "The market is easy, and about steady. There may be instances where prices are far out of line, and may need adjustment. But I'm confident there won't be any great rush to raise prices."

- The Ohio area presented some mixed answers. The sales manager of a large rubber chemical company, on one hand, viewed the market scene from what he termed an "equalization" of prices standpoint. Said he: "In the face of industry's shrinking margins, there's a tremendous pent-up pressure for price increases that would "equalize" costs. But competition will, of course, hold down prices wherever supply exceeds demand."

But in the same region, this active interest in basic chemicals is contrasted with the apathy in pharmaceutical chemicals. Big worry of drug houses is not decontrol; they're concerned over the trickling in of imported chemicals.

"Though the flow of these items isn't steady, it's raising hob with the basic scources of supply," is the common complaint.

- Attitude around Chicago, with the notable exception of the fats and oils processors, was one of reasonable optimism for steady markets plus a few upward adjustments for out-of-line items.

From one purchasing agent came the summary, "Business is level; there's no pressure to cut prices."

But the forgotten fats-and-oils men only sighed, "Our products have been so far under ceilings for so long, the question of the effect of price removal is purely academic."

Up West: Replies from Texas, less summarizing in nature, dwelt upon

What's causing the switch to fatty alcohols?

How is it possible, you may ask, that low-cost fatty alcohols will always meet my specifications? Many chemists find their answer in CACHALOT brand cetyl, oleyl, or stearyl alcohols. CACHALOT alcohols are tailor-made to your requirements to assure the most advantageous combination of properties. You buy the exact alcohols you need for bromination, chlorination, esterification, nitration, or sulfation. Your end-products are better because twenty years of original fatty alcohol research makes it possible to hold CACHALOT to close specifications. The good news is that CACHALOT costs no more. A new booklet shows what these remarkable raw materials can do for you. For your copy, write or phone *M. Michel and Company, Inc., 90 Broad Street, New York 4, N. Y., DIgby 4-3878.* Their registered trade name for the largest variety of fatty alcohols commercially available in tonnage lots of controlled purity is

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specific price and supply situations. And although the expressed outlook was for a stable price structure, most discussion revolved about items involving increases.

Largely, the feeling was that a stable period was in the offing. But products pin-pointed for possible rises outnumbered the drops by over 2 to 1.

• And in the Far West, outlook was most optimistic of all. Showing little concern over a falling-off of prices or sales, most talk was of present low inventories, greater sales, higher prices.

One purchasing agent predicted, "With the lifting of price controls, major (basic) chemicals will be under pressure for increases."

Another pointed out, "The rise in petroleum prices (particularly stiff on the West Coast) has affected solvents and resins, might affect them more."

"They're buying everything we make," is the enthusiastically gleeful response of a sales manager. His company is contemplating raising some prices—but with a careful eye on the market.

And in Particular: Pinned down to specific commodities, certain chemicals are repeatedly mentioned for future action.

Concerning price boosts:

• Sulfur is the number one topic of discussion. Estimates ranged from a $4/ton rise to a "rumor of a possible increase." Nobody is looking for a lower tag.

• Other items singled out for increases: styrene, lauric acid (for alkyds and synthetic detergents), ammonia, alum, silicates, DDT and other chlorine compounds, talcs, hydrofluoric acid, superphosphate, nickel salts.

Several products mentioned that could go up but might not (for the reasons indicated):

• Ammonium sulfate—(inventories may rise too fast to sustain a price hike).

• Urea—(increase might encourage foreign competition).

• Nitrogen, compounds—especially ammonium nitrate—(supply is short but a rise would encounter buyer resistance).

• Soybean oil—could benefit from cottonseed support program—(but not a sure bet).

Some Laggards: Most commodities, buyers and sellers opine, will not change status appreciably within the next few months.

But the exceptions, like the poor, are always with us. On the list of items with a dimmer future, sales managers posted:

• Pharmaceutical chemicals—import competition (see above) plus a generally low drug business level are main factors.

• Fats and oils—huge surpluses preclude any lift for a long time.

• Paint raw materials—a drop after current season is one considered opinion.

• Alcohols and related solvents—a gradual decline—is the outlook of the sales manager of one of the largest producers.

Inventories Down: With few exceptions, inventory stocks are reported as lean to normal. And those cases where small stocks are trade practice, buyers were down to a hand-to-mouth basis.

Where larger stocks are customary, if anyone was carrying materials in excess of 90 days, he did not admit it. Most stocks were rated as a "usual" 30 to 60-day level.

This "usual" to "low" stock status was interpreted by some to indicate lack of confidence; but at the same time many suppliers are relying on the relatively depleted inventory condition to stimulate near-term sales.

The most detailed argument in reply to the CW question, "What effect do you believe lifting of inventory control will have?" ran about like this:

(a) The maximum allowed under controls is just about the minimum for efficient operating; therefore stocks will not be cut.

(b) But larger inventories are unlikely because (1) most users have limited storage space and (2) most chemicals are in ample supply.

Result: present inventory practice will not change in the near future.

Sales Efforts Up: Most sales managers maintain they have stepped up their sales campaigns.

And on the receiving end, purchasing agents verified:

"Selling? We've found suppliers doing a lot more calling and writing than they used to. They're honestly trying again to sell."

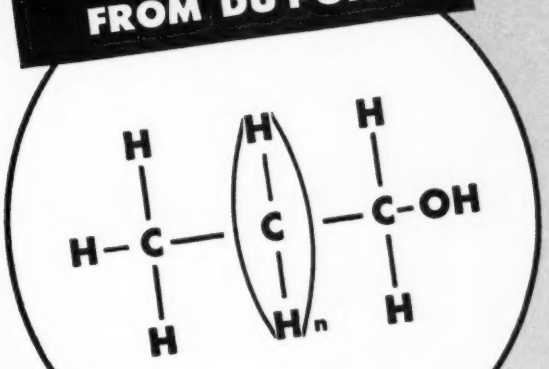
Around the Corner: Few respondents would extend their predictions beyond the next few months.

Those who ventured an opinion were all concerned over the same cloud in the sky: the possibility of expanded capacity coming in too fast.

But while apprehension over next year dampened their spirits somewhat, most sales managers were inclined to be chipper and cheerful.

One interviewee said thoughtfully: "We are building a tremendous productive capacity. We are going to produce a lot, and it's going to call for some real salesmanship to move it all."

IDEA-CHEMICALS FROM DU PONT



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Why not investigate the use of "Lorol" fatty alcohols in your business? We'll be glad to send you more information on these versatile, high-quality alcohols—specifications, properties, suggested uses. Just clip the coupon below, or write on your letterhead today. E. I. du Pont de Nemours & Co. (Inc.), Polychemicals Dept., Wilmington 98, Delaware.

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GRADES AND AVAILABILITY: Six grades of "Lorol" fatty alcohols are available, shipped in 8,000-gallon tank cars or 55-gallon drums—except as stated otherwise:

"Lorol" 5 and 7, mixtures made up principally of lauryl and myristyl alcohols.

"Lorol" 20, normal octanol.

"Lorol" 22, normal decanol.

"Lorol" 24, normal cetyl alcohol (shipped in 140-lb. fiber drums—minimum carload lot: 30,000 lb.).

"Lorol" 28, normal stearyl alcohol.

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Please send me more information on "Lorol" fatty alcohols—specifications, chemical and physical properties, suggested uses, bibliography, etc. I am interested in evaluating "Lorol" alcohols for the following applications:

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Men like Sam are good workmen. They are resourceful; learn new skills quickly; take a lot of pride in doing a job well. Many of the virtues of their pioneering ancestors are still strong in these Chessie people. Independence is one. Thrift is another. Most of these folks own their own homes. Many live on small farms. A lot develop hobbies into part-time business.

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Write to Chesapeake and Ohio Railway, Industrial Development Department, Terminal Tower, Cleveland 1, Ohio. All information is accurate, confidential and adequately supported with photos, maps, aerial surveys and vital statistics.

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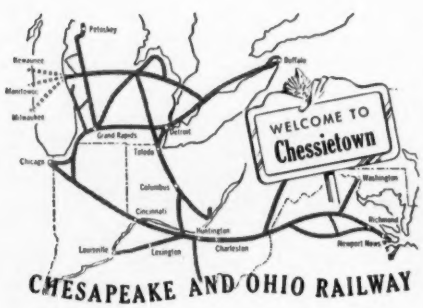


CHESAPEAKE AND OHIO RAILWAY

DISTRIBUTION . . .

HAND TAILORED BOTTLES: Competition often revolves around intangibles.

In the Lab—A Bottle Battle

Students, scientists, and dreamers — their common chemical denominator lies in the gleaming rows of bottled reagents which implement chemical experimentation.

Reagent suppliers, fighting for their share of this $10 million market, stress service, quality, and uniformity as their most potent selling tools.

A well-protected secret is out this week: Mallinckrodt is switching its entire line of non-liquid reagent chemicals to a new flat-sided, "hand tailored" bottle.

During the next few months, this development will be the focal point of a soft-toned competitive battle that will range in virtually every college and plant across the nation.

Mallinckrodt Chemical Works salesmen will redouble their courting of both the front-office purchasing agents and the point-of-sale laboratory directors and chief chemists. Their pitch will be that the new bottle increases effective shelf space by a neat 25%, that cases of equivalent sized round bottles take up 8% more storage space, that the squarish design is easier to handle, open, and pour.

But the frock-coated customers will be hearing other spiels, too. They'll be told by MCW's competitors* that "we considered this type of bottle years ago—but gave it up because of breakage along the edges." With professional courtesy, the researchers will be reminded that purity, uniformity and dependability are more important than mere package design.

These latter factors are, of course, also an integral part of Mallinckrodt's sales message. In rebuttal, the new package will be emphasized as a "bonus" for specifying "MCW" on the requisitions. And as for the breakage problem, the company is confident that its eight-month testing period—in freight, express, and parcel post shipments—has proved that the rounded edges will cause no complaint.

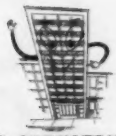
Hidden Costs: It is significant that little, if any, mention is made of prices. Reagent costs are usually an insignificant part of a laboratory's operating expenses (although an average of industry estimates puts the total annual market at $10 million). Glassware and equipment, alone, will usually run three to five times the cost of reagents on a per chemist per year basis.

Moreover, with price books containing up to 1,000 items, it is impossible to keep track of each individual chemical's competitive position. Instead, the effort is directed toward keeping the book, as a whole, in line. Bids covering twenty or thirty different reagents will be competitively close—even though there may be broad variations if examined item by item.

The pricing of the individual reagents is hardly an exact science. Few of them are produced on a year-round basis. Most are made in flexible equip-

* See listing, page 75.

floor please?
We have 10
of 'em
providing



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THERMOCHEMISTRY—Heats of reactions, thermodynamic calculations.

CHEMICAL EQUILIBRIA and KINETICS—Equilibrium constants, reaction order and molecularity.

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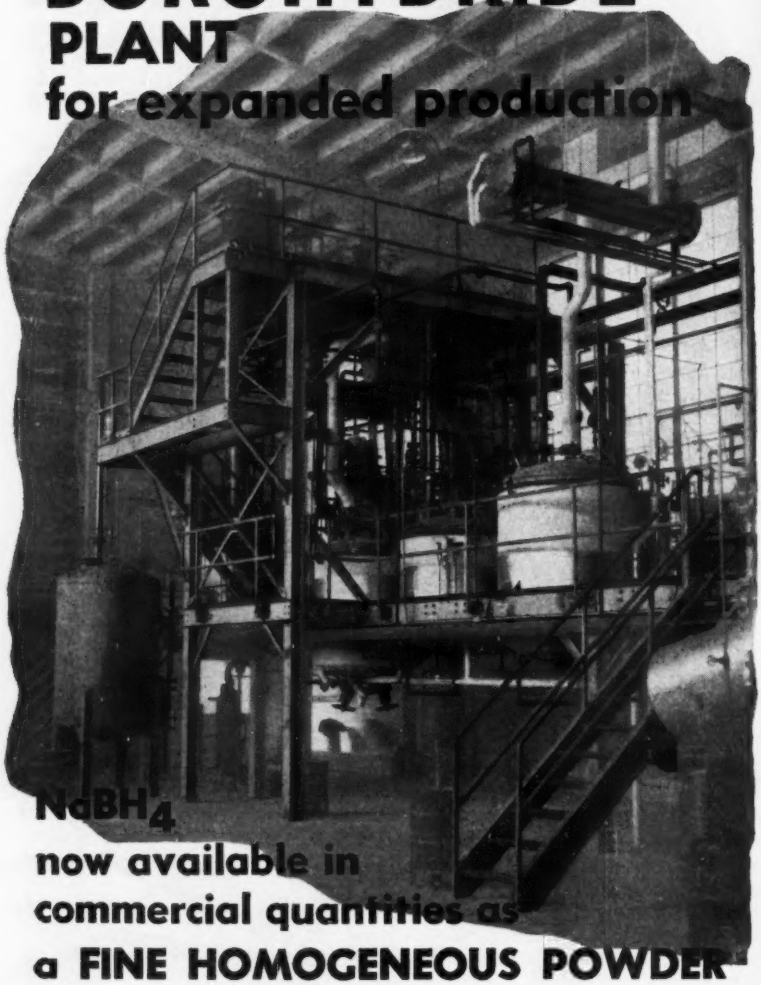

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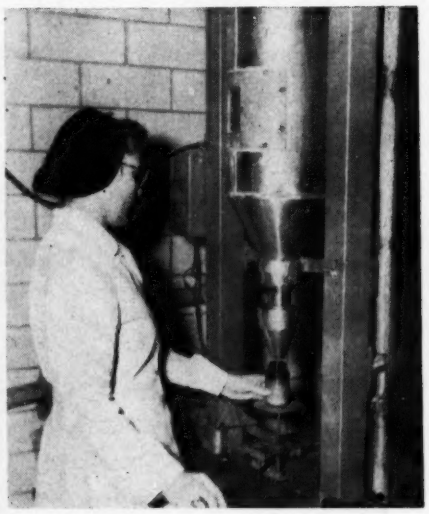

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ment which can be shuffled from one product to another. And with such a highly unpredictable market, inventory and production controls on various finished items are hard to apply.

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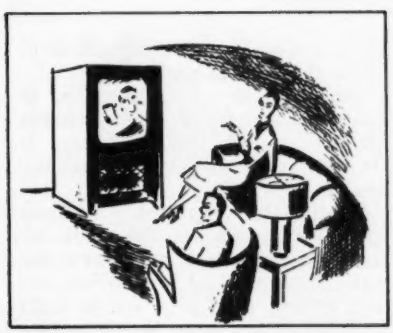

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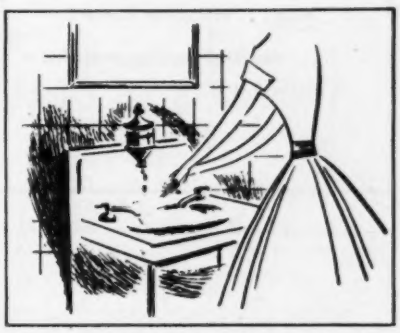

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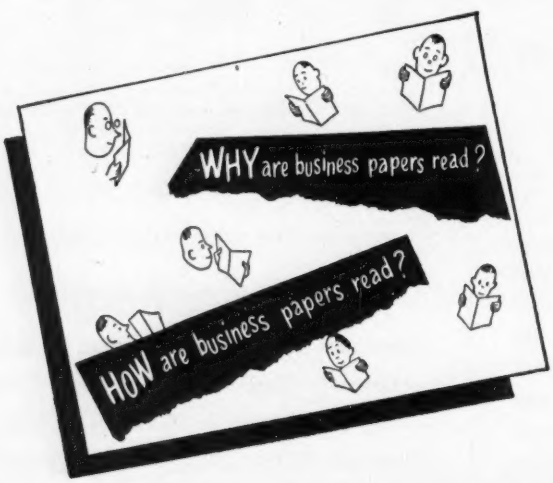

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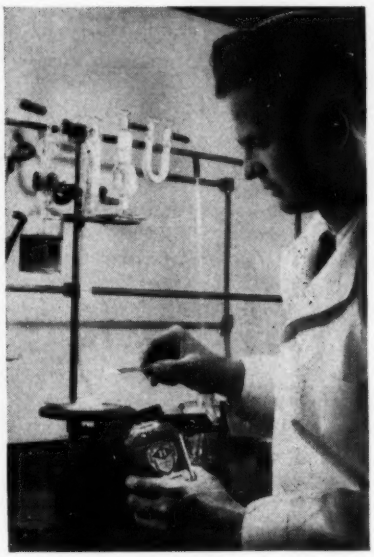


. . . add up to a $10 million market in the laboratory.

at a reasonable price—regardless of what the costs might be.

No effort is made, therefore, to make a standard profit on every bottle of every reagent. The aim, instead, is to show an income for the overall operation.

Most price complaints come from purchasing agents who also handle the same chemicals in commercial quantities. Why, they ask, should common salt (at less than 1¢/pound in bulk) cost 33¢/pound when bought as "Sodium Chloride, Granulated, U.S.P."?

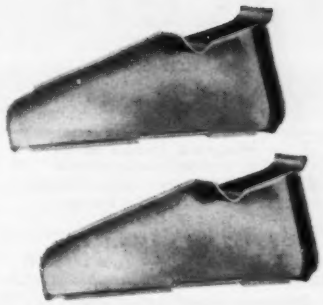
Reagent salesmen facing this question usually point at the bottle costs—the inescapable floor under all reagent prices. The bottle, band, cap, label, and carton for any five-pound package costs at least 25¢. The same things for a one-pound bottle run up to 19¢, and for quarter-pounders, 12¢. On a per-pound basis, the packaging cost for quarter-pound units is therefore 48¢—not including labor. This can sometimes exceed the value of the contents.

In general, however, price is rarely the determining factor in deciding between two competitive reagent lines. Instead, the scales are tipped by the more subtle selling points of purity and dependability. These are hard-to-prove factors, and an individual chemist's preference may be as unsubstantiated — and unchangeable — as his choice of cigarettes.

J. T. Baker Chemical Co., for instance, has long been proud of its "actual analysis" policy; it prints the specific batch's analysis on each bottle. Yet Baker & Adamson, Mallinckrodt, and Merck—the other three of the four

Where would the price of pork be if hog cholera continued to destroy millions of pigs? It has done that since its discovery 120 years ago. One infected pig could destroy a herd of 1000. Hog cholera serum, developed during the last decade, and largely made on Stokes Freeze-drying equipment, is eliminating the scourge of hog cholera from the world's stock farms. The same type of Stokes equipment is used in the preparation of "wonder drugs" which daily save the lives of thousands of humans.

What converts the dull two-cent slush-metal casting to the brilliant piece of costume jewelry? Just three millionths of an inch of aluminum! It vaporizes under vacuum, deposits itself on the dull surface, and the ugly duckling becomes a sparkling decoration. Low-cost molded plastic is also used as a base. Over the aluminum is applied a lacquer coating. With this alone, the aluminum looks like brilliant silver; the top-coat can also be dyed in colors which simulate silver, gold, copper, selenium or other metals.



What is the difference between these two seemingly identical castings? One will leak; one will not. Both have tiny pores which often occur in casting but are quite invisible to the eye. But one of these castings has been impregnated with a sealing compound in Stokes Vacuum Impregnating equipment. When the compound has hardened, the casting is proof against heat and pressure. Many manufacturers are eliminating the cost of rejected castings by vacuum-impregnating *all* castings without test.

Many watch-springs are now annealed in vacuum to modify surface characteristics of the metal, and improve mechanical properties. The process also offers great economies over treatment in controlled, or inert, atmosphere. Similarly titanium and zirconium sheet and bar stock must be annealed in vacuum. Indeed, these metals, after ores are reduced to oxides, must be handled almost entirely under vacuum until they reach finished shape. In the presence of air, they tend to combine with the material of the vessels in which they are processed.

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Distribution: There is also a wide variation in the method used by the big reagent producers in distributing their products. Baker & Adamson has established a national network of stockpoints, and sells an appreciable portion of its total volume directly to the laboratories.

J. T. Baker, in contrast, reports that over 90% of its sales are through distributors. The others lie somewhere in between. Many of the distributors also produce and package a few reagents under their own labels—and nearly all of them depend on laboratory equipment as their main source of income. But the reagent line that they happen to be carrying is always a handy door-opener into the laboratories—so there is usually close cooperation between the distributors and the basic producers.

Looking ahead, the reagent sellers see no room for pessimism. Research is a booming industry, in itself, and there is every likelihood that this will continue. Every one of the major producers is backstopped by an industrial chemical department which can capitalize on specific reagents which grow up into bulk fine chemicals. And at the one-to-five-pound bottle level, the stocking of new high-school laboratories during the next few years (as

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the present swarm of elementary school children grows up) will provide a boomlet of its own.

In square bottles, or round, it is a future and a market worth scrapping for.

Sales Changes

To serve textile mills and manufacturers in the southern textile belt, Carbide and Carbon Chemicals has opened a new Dynel district sales office at Charlotte, N.C. John McCormick will be in charge of the new sales group.

• New York's Fallek Products Co. has been appointed exclusive U.S. representative for Astra Chemicals Ltd. of Bridgewater, England, on sales of Vitamin D_2.

• The Chemical Division of Kaiser Aluminum & Chemical Sales, Inc., has established a Central Division sales headquarters at Hammond, Ind. R. L. Petersen is the new division sales manager.

• Peter Davis, a former vice president of Ansbacher-Siegle, has formed the Davis Color & Chemical Co. (New York), distributor of pigment products.

• The Mid-South Chemical Co. (Memphis, Tenn.), distributor of anhydrous ammonia for fertilizer uses, has started the construction of modern offices for its headquarters staff.

• The Owens-Illinois Glass Co. is also building. Its addition is a $1-million warehouse near Atlanta, Ga., for the distribution of glass bottles in the Southeastern states.

•

Explosives: The Hercules Powder Co. has requested permission to tranship up to 175 tons of explosives per shipment at Wilmington, N.C.

•

Dynamite: The unloading of dynamite at Honolulu is still raising problems. After Congressional action last year, the Coast Guard lifted the limit to 50 tons, specifying that ships carrying more than that quantity must stay off-port at an explosives anchorage while the material is sent in to the dock via 50-ton barge loads. But the trial run on the new system wasn't too successful. The first ship, a Matson Lines' Liberty carrying 90 tons of dynamite, took two days to make the delivery—at an estimated cost of $4,000 in ship's time.

•

Jersey Move: Frazier & Son, makers of Whiz-Packer packaging machinery, has moved its manufacturing operations from Belleville to Clifton, N.J. Objective: a 300% increase in production space.

Consult SCHUTZ-O'NEILL

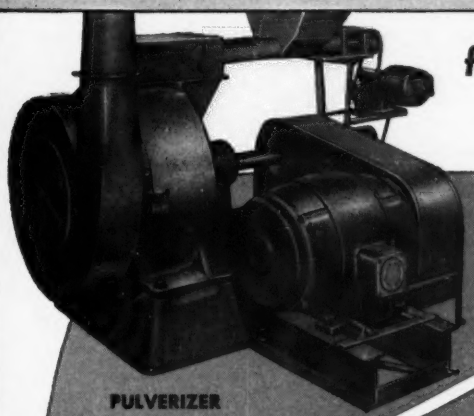
for latest methods and equipment if you:

PULVERIZE

GRANULATE

CLASSIFY *BY AIR*

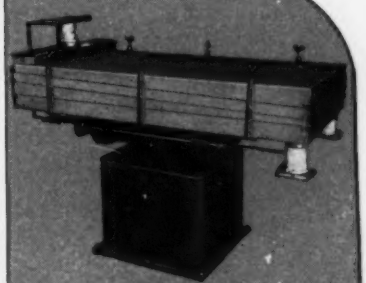
SEPARATE *BY SIFTING*



PULVERIZER
Air force pulverizer produces particles from 40 mesh to low microns sizes. Easily adjustable.

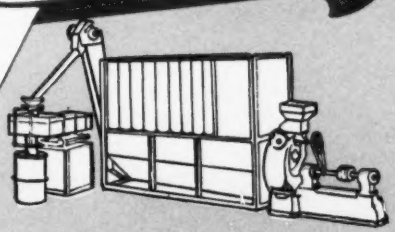
ROLLER MILL
The pioneer ball bearing roller mill. High capacity, with fine, even, grainy product.

AIR CLASSIFIER
Absolute air classification—no moving parts. Classifies and separates fractions ranging from 1 to 100 microns.



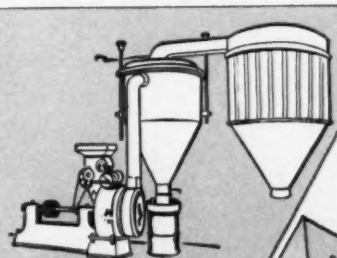
GYRATOR SIFTER
Separates fibers, shreds, coarse particles from all types of pulverized materials. Non clogging.

***Consult* SCHUTZ-O'NEILL**
Engineering Service for Mill Plans



MILL PLAN 45—Mill, Horizontal Tubular Dust Collector, Elevator, Gyrator Sifter.

Illustrated here are two from a large variety of Mill Plans, suggesting efficient operating setups for any material or plant layout. If you will advise us of your requirements, Schutz-O'Neill Engineers will recommend a suitable mill plan and equipment for your own use.



MILL PLAN 30—Mill, Cyclone Collector, Tubular Dust Collector.

Write for circular and name of SCHUTZ-O'NEILL Sales Engineer nearest you.

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- Ease and economy of handling.
- Dependable source of supply.
- Availability as Formaldehyde Solution N.F. and 37% Methanol-free Formaldehyde.
- Shipment in tank cars, tank trucks, 475 lb. drums, 100 lb. carboys and 1, 5 and 9-lb. bottles.

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